Madeley Printer 3 Wellington St. Strand

TOMB OF ALLEN CUNNINGHAM ESQR. AT SYDNEY.

THE LONDON JOURNAL OF BOTANY;

CONTAINING

FIGURES AND DESCRIPTIONS

OF

SUCH PLANTS AS RECOMMEND THEMSELVES BY THEIR NOVELTY, RARITY, HISTORY, OR USES;

TOGETHER WITH

BOTANICAL NOTICES AND INFORMATION,

AND

OCCASIONAL MEMOIRS OF EMINENT BOTANISTS;

BY

SIR W. J. HOOKER, K.H., D.C.L., F.R.A., & L.S.

VICE-PRESIDENT OF THE LINNÆAN SOCIETY; HONORARY MEMBER OF THE ROYAL IRISH ACADEMY; MEMBER OF THE IMPERIAL ACADEMY CÆSAR-LEOPOLD. NATURÆ CURIOSORUM; OF THE IMPERIAL SOCIETY CÆSAR. NATURÆ CURIOSORUM OF MOSCOW; OF THE ROYAL ACADEMIES OF SWEDEN, PRUSSIA, LUND; OF THE ACADEMIES OF PHILADELPHIA, NEW YORK, BOSTON; OF THE NAT. HIST. SOCIETY OF MONTREAL, &c. &c.
AND DIRECTOR OF THE ROYAL GARDENS OF KEW.

VOL. V.

WITH TWENTY-FOUR PLATES.

LONDON:
HIPPOLYTE BAILLIÈRE, PUBLISHER,
FOREIGN BOOKSELLER TO THE ROYAL COLLEGE OF SURGEONS, AND TO THE ROYAL MEDICO-CHIRURGICAL SOCIETY,
219, *REGENT STREET.*
PARIS: J. B. BAILLIÈRE, RUE DE L'ÉCOLE DE MÉDECINE.
LEIPZIG: T. O. WEIGEL.
1846.

LONDON:
Printed by Schulze and Co., 13, Poland Street.

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SUPERINTENDENT OF THE ROYAL BOTANIC GARDENS, CEYLON.

THE

LONDON JOURNAL OF BOTANY.

EDITED BY

SIR W. J. HOOKER, K.H., L.L.D., F.R.S., & L.S.

DECADES OF FUNGI; *by the* REV. M. J. BERKELEY, M.A. F.L.S.

(Continued from Page 315, *Vol. IV.)*

DECADE XI.

101. Ag. *episphæria,* n. sp.; pileo resupinato margine tantum libero, subflabelliformi pallido subtomentoso; lamellis cervinis albo-marginatis. *Drège*, n. 9413, *a.*

On decayed *Sphæriæ.* South Africa; *Drège.*

Pileus subflabelliform, ½ an inch long, attached, with the exception of the arched margin, by fine downy threads and a few fibres to the matrix, pale subtomentose, especially at the extreme edge. Stem none. Gills moderately broad, fawn-coloured with a pale edge.

This Agaric belongs to the same section with *Ag. variabilis,* but appears perfectly distinct from every described species. I have not been able to find perfect spores.

102. Marasmius *hepaticus,* n. sp.; cæspitosus; pileo hemispherico glaberrimo stipiteque supra subæquali deorsum incrassato glabro fibroso cartilagineo hepaticis; lamellis subliberis distantibus postice attenuatis fulvis.

Amongst dead Fern, &c. Van Diemen's Land, *R. Gunn,* *Esq.*

Cæspitose, pileus hemispherical, ¾ of an inch broad, subcarnose, quite smooth, liver-brown. Stem 1½ inch high, 1½ line thick, of the same colour as the pileus, smooth, cartilaginous, composed of stringy fibres attached, at the slightly incrassated base, to leaves, &c., by the reddish downy mycelium. Gills fawn-coloured, nearly free, rather narrow, attenuated behind; margin thin and denticulate; interstices smooth.

A beautiful species, somewhat resembling *M. erythropus*, but quite distinct from every described species.

103. M. *sarmentosus*, n. sp.; pileo hemispherico subspadiceo primum umbonato dense sericeo, margine involuto demum expanso; stipite villo depresso vestito, demum glabrescente eximie sarmentoso.

On dead leaves, especially on their nerves, little sticks, &c., from thence spreading and attaching itself to every plant in its neighbourhood. Jamaica, *Mr. Purdie.*

At first appearing under the form of a little silky tubercle, varying in size according to the nature of the matrix; this soon acquires a stem, which is rapidly elongated, occasionally to the extent of several inches, and remains for some time perfectly simple; more frequently, however, it becomes attached to some neighbouring object by a little patch of white or reddish down, so that a mass of the plant, when gathered, presents quite a Flora of mosses, ferns, and dead or living phænogams. It soon throws off, at right angles, short lateral branches, which are sometimes opposite, each terminated by a little pileus, in general, smaller than the primary pileus.

Pileus ½-1 line broad, at first subglobose from the margin, being strongly involute, tipped with a conical umbo, densely silky, bright-brown or tawny, at length expanded but still retaining some traces of the umbo. Stem thickest at the base, setiform varying greatly in length, sometimes eight or nine inches long, without branching, sometimes on the contrary, branched when scarcely exceeding an inch, clothed at first with pale more or less closely adpressed and generally

deflexed hairs, at length quite smooth and striated. The branches spring from the main stem, exactly in the same manner as the original stems from the nerves of the leaf. As all the pilei were more or less injured by insects, I am unfortunately unable to describe the gills.

This curious species is allied to *Marasmius dispar* and *M. chordalis.* The simple individuals resemble somewhat *Ag. stipitarius.* I suspect that, in the present instance, the greater or less branching of the stem is normal; but, as this is not certain, I have omitted it in the specific character. It must be a very beautiful and striking object when growing.

104. Thelephora *subhepatica,* n. sp.; tota resupinata orbicularis hepatica margine membranaceo-byssoideo subfimbriato pallidiore; hymenio glabro hic illic minutissime reticulato.

On dead bark. Casapi, Peru.

Forming orbicular entirely resupinate patches, about 1¼ inch broad, at length confluent, liver-coloured, extremely thin and inseparable from the matrix; margin paler, subfimbriate, byssoid, but membranaceous. Hymenium smooth, not setulose or cracked, but here and there very minutely reticulate with raised lines.

The general appearance is not altogether dissimilar from *Hydnum fimbriatum,* but it is less fimbriated and is not, like that, separable from the matrix.

105. Corticium *Drègeanum,* n. sp.; effusum, resupinatum papyraceum e matrice separabile ochroleucum supra subtiliter tomentosum; hymenio rimosiusculo glabro papillato. *Drège,* n. 9451, *c.*

South Africa, on bark.

Forming effused ochroleucous somewhat elongated patches, 3-4 inches long, 1½ inch broad, separable from the matrix, above minutely tomentose; hymenium glabrous, minutely mealy, rather rugged papillose, slightly cracked.

Resembling somewhat *Corticium molle* but easily distin-

guished by its thicker flexible substance, which is separable from the matrix.

106. Hexagonia *similis*, n. sp.; pileo sublaterali suberoso-coriaceo tenui explanato e pallido ligneo-fulvente, zonis postice crebris antice paucioribus rugosis, lineis prominentibus hic illic notatis, glabro sericeo-nitido; poris parvis pallidis intus primum pruinosis; margine hymenii sterili.

Australia. Gathered by one of the officers of the Beagle.

Pileus sessile, or furnished with a very short orbicular stem, 3 inches long, 4½ inches broad, suberoso-coriaceous, slightly flexible, thin, especially towards the margin, repeatedly and sometimes closely zoned, rather rugged and marked with a few raised lines which, however, do not form bristles, of a brownish wood-colour, smooth with a satiny lustre; the extreme edge only minutely velvety, but soon becoming smooth.

Hymenium paler than the pileus, rather uneven; pores subhexagonal, small, 1-50th of an inch in diameter, pale at first, pruinose within. Substance of the same colour as the pileus.

This species is allied to *H. polygramma*, Mont.; though the pileus is thicker and the pores much smaller. In *H. polygramma* there appear to be no finer zones; but in the present species, in an early stage of growth, the pileus is very closely zonato-striate. Its relation to other species is more distant. It is possible that in every species of Hexagonia there are distinct varieties, exhibiting pores of various sizes, of which I fancy that I have some evidence. In this case, the species will require reduction, and this will be registered under *H. polygramma*, for there will be no other point of much consequence, except that of the barren margin of the hymenium and the rather convex than concave pileus. The fine zones behind are at length concealed in the course of growth, by an anamorphosis of the external cellular tissue.

107. Polyporus *brunneo-leucus*, n. sp.; imbricatus, postice

effusus; pileis dimidiatis subzonatis rugosis tenuibus coriaceis subflaccidis é ferrugineo fusco-nigricantibus velutinis hic illic glabrescentibus, hymenio pallido poris parvis angulatis subintegris vel denticulatis; dissepimentis tenuibus.

Van Diemen's Land, *R. Gunn, Esq.*

Pilei imbricated, decurrent behind, dimidiate, 1½ inch broad, ½-¾ of an inch long, thin, coriaceous, but flexible and very light, rugged behind, and irregularly zoned or sulcate, at length nearly smooth, in front more even, clothed with slightly tawny velvety down, which however, in old specimens, entirely vanishes. Extreme margin thin and dark; substance pale, soft.

Hymenium pallid, nearly white, but becoming rather darker with age; pores small, 1-60th of an inch in diameter, angular, nearly entire or slightly toothed; dissepiments thin.

A very pretty and singular species, resembling somewhat young specimens of *Pol. cuticularis* (Bull.), but not becoming rigid like that, and a far smaller plant, not to mention the different appearance caused by the zones, and the soft velvety, not at all hispid covering. The pileus consists of three distinct strata; the first spongy, beneath which is a thin dark cuticle covering the pallid substance from which the pores immediately spring. The colours are as nearly as possible the same. There is an analogy between this species and *Stereum bicolor*. Sometimes the apex is elongated and the little pileus becomes triquetrous, as in that species.

108. Peziza *fusispora*, n. sp.; gregaria subconferta sessilis cupulis hemisphericis planis vel concaviusculis luteis tomentosis; sporidiis utrinque leviter attenuatis.

On earth, mixed with particles of charcoal. Van Diemen's Land, *R. Gunn, Esq.*

Gregarious, here and there crowded, 1-2 lines broad, orange-yellow, hemispherical, slightly concave, or quite flat, with a delicate membranous edge, obscurely tomentose, fixed to the soil by a little down. Asci cylindrical, obtuse. Sporidia elliptic, attenuated slightly at either end, and con-

taining two globose nuclei, which themselves also apparently contain a nucleus.

Allied to *P. subhirsuta*, but differing essentially in the form of the sporidia. In that species, as published by Desmazières, n. 462, I find them oblong-elliptic, with the apices quite obtuse. I know of no instance of fusiform spores in *Peziza*, except in a variety of *P. leucoloma*, figured by Corda, Fasc. 2, fig. 135.

109. Leotia *elegans*, n. sp.; stipite elongato gracili sursum subattenuato; capitulo brevi clavæformi stipite vix crassiore.

United States, North America, *Mr. Greene.*

Stem 2½ inches high, scarcely half a line thick, smooth, slightly attenuated upwards. Head 1-2 lines long, a little thicker than the stem, clavæform, sometimes bifid. The whole plant when dry is of dull orange-brown. This is a very distinct species, allied to *Leotia uliginosa,* with which it cannot be confounded. If I have seen correctly, the asci are lanceolate, and the sporidia oblong. It is not described by Schweinitz.

110. Sphæria (Lignosæ) *enteroxantha*, n. sp.; inæqualis suborbicularis rugosa nigra intus pulverulenta aurea; peritheciis oblongis; ostiolis prominulis punctiformibus.

On dead sticks. British Guiana, *Sir R. Schomburgk.*

About 1 line broad, irregular, subglobose, bursting through the bark, rugged; sometimes confluent, black; perithecia oblong with a short neck, more or less powdered with yellow; stroma golden yellow in the centre, as is also the surface of the wood beneath the bark. Ostiola prominent, punctiform. Asci narrow, clavate. Sporidia very minute, curved.

Closely allied to *S. flavovirens*, but distinguished by the golden yellow of the centre of the stroma. The sporidia agree in form.

(*To be continued.*)

BOTANICAL INFORMATION.

Unio Itineraria. Abyssinian Plants.

The fourth section of the "Abyssinian Plants," collected by Schimper, amounting to 400 species, have recently been distributed. Like the former sets, this contains very good specimens; but the number of species in the present section which have been previously sent is so great as to take away materially from the value of this portion, and we should fear will not give satisfaction to the subscribers. It would appear that Mr. Schimper being fixed in a certain spot, has no longer the range of country to visit which is likely to afford much novelty to the Botanist. The numbering upon the tickets now amounts to 2000, or nearly so; but that we apprehend will give a very incorrect idea of the amount of species that the subscribers have received. The Unio Itineraria has done great good to Botany, and we have done every thing in our power, both by individual subscription and by inducing others to aid in so praiseworthy an object; and we are aware of the great difficulties it has had to encounter, and the losses it has sustained by accidents and otherwise; but we should be sorry to see its usefulness lessened by disappointing the just expectations of the subscribers.

The following is a translation of the Prospectus, which has accompanied our own set of the fourth section of the Abyssinian Plants.

"In remitting to our subscribers the third portion of the Abyssinian Plants, we add a few necessary remarks.

"Before all, we have to excuse ourselves for the delay that has taken place in sending out this portion of the collection. It has been occasioned by the long illness, terminated by the unexpected death of the friend, who for many years has assisted us in the direction, and who specially undertook the business of distribution. The distribution, thus interrupted against our will, could not be taken up

again and carried through so quickly as we could have wished.

"If in this third collection there be found, besides many new and interesting plants, a considerable number also of species which were already contained in the former portions, we admit that we should have preferred enriching the herbaria of our subscribers and science generally, with new species only; but we could only transmit what our Abyssinian friend himself had sent us, and were unwilling to omit anything, since in regard to the rare species at least, a second specimen cannot be unacceptable.

"The price per century, has been fixed as low as that of the first portion, that is to say 15 florins, and we could have lowered it still more, as we had expressed our intention in sending the second portion, but that Mr. Schimper had earnestly begged us to remit to him whatever funds we might have in hand or could collect, although he has for the moment stopped his remittances of plants, and placed himself in a situation independant of the Unio. He has, indeed, for the last two years, married in Abyssinia, and procured the King of that country, Ubie, to appoint him ruler of a district. The seat of his government, or of the capital of the district he holds under Ubie, is Antitscho. This political position of his has prevented him during the latter years from doing anything for the Unio; for the third collection we now send out, is the result of his herborisations of the year 1842. But he added, to the request contained in his last letter that we should send him manufactured goods, implements, &c., a promise to send hereafter to the directors of the Unio, objects of natural history and especially dried plants; and we therefore thought we were acting according to the wishes of our subscribers, or at least of the majority of them, in complying with his request, so far as the funds in hand or the sale of the remaining collections admitted.

"It is a gratifying circumstance, that this intrepid traveller should have earned for himself, as a reward for his efforts and contributions, an independent and honourable position, by which he has proposed to himself, as the

object of his exertions, the diffusing gradually the advantages of European civilisation amongst the people of Abyssinia; for to this end, as he distinctly writes, are his endeavours directed, and it is this noble design which has enabled him to give up his own fatherland. Should he succeed in effecting anything permanent, then the Unio Itineraria may congratulate itseif on having contributed its mite, or at least on having given the opportunity for it, by sending Mr. W. Schimper to Abyssinia.

"It is less satisfactory, that Dr. Welwitsch at Lisbon, appears to have forgotten his engagements with the Unio, and has not fulfilled his often repeated promises of continuing his remittances of Portuguese plants. We reserve to ourselves the hope of compensating those subscribers who have thus felt disappointments, proportionate to the amount of their contributions, by a future remittance of Abyssinian plants, or by some other means as far as we are able, if the lately repeated promises of Dr. Welwitsch remain unfulfilled.

"PROF. HOCHSTETTER.
"DR. STEUDEL.

"Esslingen, August 15, 1845."

Heldreich's Oriental Plants.

South European and Oriental Botany is under immense obligations to M. Boissier, of Geneva, for the services rendered by his admirable descriptions of new and rare species, no less than by the encouragement he has afforded to collectors, and by the determination of the species amassed through their means. M. Theodore Heldreich is one of the ablest of these collectors, and the distribution of his collections has given the greatest satisfaction to all the subscribers. Those of Greece, formed in the autumn of 1843 and spring of 1844, especially those from the mountain chains of Malévo and of the Taygetes, have been mentioned in the early part of our last volume, p. 41, and those yet to be expected from him are intimated in the article which im-

mediately follows upon that one. We have now the pleasure of being able to state, that highly favourable intelligence has recently been received from M. Heldrecih. He had just returned to Korieh, after having explored the central Taurus, where he had made very extensive collections, from 700 to 800 species. In this collection, there is a remarkable predominance of *Scrophularineæ* (30 species of *Verbascum*), of *Caryophylleæ* (viz: 18 *Dianthus*, 24 *Silene*), of *Labiatæ*, of *Leguminosæ*. The collections cannot be dispatched to Geneva till the ensuing spring, nor distributed till the summer, on account of the absence of M. Boissier. The centuries; which will exceed the amount of subscription (as stated, l. c. p. 41) of each subscriber, will be reckoned to him at 30 francs of France; this slight increase being necessary to meet the heavy expenses of the journey, and the same price will be put on the collections of the future journies of M. Heldreich. The journey in view for the next year, will probably be the Oriental Taurus and Cappadocia.

Kotschy's Plants of South Persia.

We re-set the type in order to give to our readers information of the distribution of a most valuable collection of the Plants of South Persia, examined and named by M. Boissier under the direction of Dr. Hohenharker, of Esslingen, near Stuttgart, to whom subscribers' names may be sent. The set amounts to 820 species, the price is very moderate, the number of new species very considerable; and the whole in beautiful condition.

Mr. Spruce's Pyrenæan Plants.

Mr. Spruce's object in visiting the Pyrenées has been already detailed at p. 197 of our last volume. We are now able to state that he has been very successful in his researches in that country, having collected most of the best

flowering plants of the Pyrenées, and an immense harvest of Cryptogamæ. He has made three short excursions into Spain, (two into Arragon, one into Catalonia), and some interesting ones with M. Dufour in the Grandes Landes, and has explored the Pyrenæn range from the Vallée d'Aspe to the Maladetta; and he proposed (his letter was dated Bagnères de Bigorre, October 29,) continuing to herborize in the mountains, till prevented by the snow. He will probably return to England, to publish his collections, about the end of February of the present year, when it may be expected they will be at once prepared for distribution.

Mr. Fortune's Chinese Plants.

We can now announce that Mr. Heward, of Young Street, Kensington, has commenced the distribution of Mr. Fortune's Specimens of Plants from China.

Notice of the Sale of the Herbarium of Dr. Graham, late Professor of Botany in the University of Edinburgh.

It is well known that Dr. Graham, while Professor of Botany in the University of Edinburgh, a post which he honourably filled for a period of twenty-five years, amassed a very extensive herbarium, of which a great part was obtained by purchase, at considerable expense, and the rest consisted of presents from distinguished travellers and scientific friends. We know it to be a collection of very considerable extent and in excellent condition, and that it is the intention of the family to dispose of it by public sale in the spring or early summer of next year in Edinburgh; previous to which period, catalogues, indicating the nature of the lots, the place and time of sale, &c., will be circulated both in this country and upon the continent. A most complete *Hortus Siccus* of British Plants, named on the best authorities, constitutes a very small portion of this collection; which is eminently rich in East Indian Plants, the gifts of Lady

Dalhousie, Dr. Wallich, Dr. Wight, Colonel and Mrs. Walker, &c. &c., and it contains full sets of most of the plants that have been offered for sale by the *Unio Itineraria* and by various collectors, such as Gardner, the two Drummonds, Hartweg, Cuming, Mathews, Bridges, Tweedie, &c.

We shall not fail to give further notice in the pages of this Journal, as soon as the nature of the herbarium has been fully investigated, and a catalogue of the contents prepared.

Lindheimer's Plants of Texas.

In the third volume of the present Journal, p. 140, is announced Mr. Lindheimer's intention of devoting some time to the collecting of plants for sale, in Texas. The first series has been distributed, and we can confidently say that finer and better prepared, or better selected specimens, have seldom come under the notice of Botanists, and Mr. Lindheimer has, as he pledged himself he would do, excluded from them the common plants of the South-western States. The species are all labelled and numbered, and a list of names has been already published by Dr. Asa Gray, and copies of this Catalogue have reached this country.

One object of the present notice, is to give the opportunity for saying that, together with the sets ordered by ourselves and friends, there have come two which are undisposed of, and which can be had by applying to the Editor of this Journal, at the price mentioned above, (Vol. III. p. 140) with the addition of the share of freight. One of the two contains 186 species, the other 181 species.

British Desmidieæ. With Coloured Figures of the Species. By J. Ralfs, M.R.C.S.

In this important work, the author proposes to describe and illustrate all the British *Desmidieæ*, and as correct figures

will be absolutely essential to make the descriptions of such minute objects intelligible, he will spare neither care nor expense in rendering the plates, which will be executed under his own eye, as accurate as possible.

The engravings will be on copper, since experience has proved that the delicate markings of the *Desmidieæ* cannot be sufficiently displayed by lithography.

Upwards of one hundred species will be introduced, many of them either altogether new, or now first noticed as British.

The conjugated state of the *Desmidieæ* is interesting, sometimes from its resemblance to the same state in the *Conjugatæ*, sometimes from the similarity of the spores to fossil bodies found in flint, and considered by Ehrenberg and other naturalists as a species of *Xanthidium*. On these accounts, and also because few instances have been hitherto recorded, it is intended to give not only full details of the process, but as far as practicable, to show the different stages, by figures. Examples will be taken from one or more species in each of the following genera; *Glæoprium*, *Didymoprium*, *Micrasterias*, *Euastrum*, *Cosmarium*, *Xanthidium*, *Staurastrum*, *Tetmemorus* and *Closterium*.

As their animal nature has been maintained by many able writers, this question will be examined, and sufficient reasons produced for considering the *Desmidieæ* to belong to the vegetable kingdom. Their modes of growth and other facts which may illustrate their œconomy, will receive particular attention.

That nothing may be wanting to the utility of this monograph, the introduction will contain ample directions for finding and gathering these minute plants, and the different methods of mounting them for the microscope.

Names of Subscribers, to whom the price will be one guinea, received by the Author, Penzance, Cornwall.

Zeyher and Burke;

South African Collections of Plants.

(*Mr. Burke's Journal, continued from Vol. IV. p.* 643.)

On the 9th of Nov. I heard that the "Deborah," arrived in Algoa Bay, has our goods on board, and, being satisfied on this point, and finding that my people behave so ill in the village that they are threatened with imprisonment, I determined on quitting Uitenhage and going to Saut Fonteyn, nine miles off, whither the paper, &c. can be sent to me from Algoa Bay. It was only by promising them some brandy that I could induce the men to come, and one Hottentot, whom I had dispatched to fetch the oxen, staid away all night, obliging me to send another to look for him next day. At last we started, with three waggons and thirty-six oxen in good condition, and getting rid of the women with less trouble than I anticipated, we went to Saut Fonteyn. On the 11th I visited the source of the stream which supplies Uitenhage, and found the ground where the water rises covered for a considerable space with *Cliffortia elegans*. On the hills around, *Helichrysum nudifolium, Lissochilus speciosus* and *Jasminum Capense* were common. We had not been long at Saut Fonteyn, when two Hottentot women arrived, who apparently persuaded William Kafir and another man to apply for permission to spend a day at Uitenhage, where I heard they were soon imprisoned, and only released to return directly to me, which they did in great ill-humour. We saw in this neighbourhood some duikers and grais boks, and shot several birds. The *Nymphæa scutifolia* was beautifully in flower in the river. The weather became very fine and warm, the thermometer often indicating 90° in the shade. One night a lion crossed the path but a short distance from the waggons.

Punyer having arrived from Algoa Bay without the paper, and only bringing two cases of articles of very little conse-

quence, I decided on losing no more time and starting immediately for the interior. Months have already been wasted in waiting for my goods. I therefore gave orders for departure from Saut Fonteyn on the 17th Nov., and crossing the Sundays River, we halted for the night at Commando Kraal, where we killed a grais bok and a bush bok. *Plumbago Capensis* was in full bloom. For four days we had much stormy weather. At a small stream called Mill River, which we crossed on the 22nd, the hills were quite pink with a species of *Watsonia* in full flower. Another dog died here, the third since we left Cape Town. It is said that these animals, when brought from England, seldom survive long in Africa. On the 24th we arrived at Graham's Town, where I bought a stock of paper, and two days after, reached the Fish River, which we crossed without difficulty, though we had heard alarming reports of its swollen state from persons who were perhaps anxious to keep us as long as possible in their vicinity, hoping to obtain a share of our tobacco, coffee, &c. From this time to the 6th of December, we pursued our journey with little adventure, the track crossing and recrossing the Fish River several times, till the rains, which fell heavily at night, had increased that stream so much that we found it impassible, and we halted at a place called Cradock, and took the opportunity of having some repairs done to our waggons. We saw and shot several spring boks, black grous, quaggas, and many kinds of birds, the skins of all which gave us much occupation in preparing during the intervals of halting. Thus we went on till the 16th of December, when we reached the boundary of the Cape Colony. At a farm-house lives a Smith, who undertook to repair our waggons, but failed to do so, because he had neither iron nor coals! Stanley cranes, ibis calva, and spring boks, were seen in great numbers on the plains hereabouts. On the 19th we came to Orange River, which is traversed on a very convenient raft; but first the waggon requires to be put in order, a job occupying two days, during which our diet was agreeably

varied by a quantity of fish we caught in the Orange River. We crossed the stream on the 22nd. The days were warm and fair, but heavy thunder-storms and rain prevailed at night. We halted for a day on a high hill called Wolves Kop. A sheep which we had purchased was so carelessly put on the waggon that we lost it, so the people went out to hunt the rhu boks on the hill, and one was caught by a Hottentot. Hyænas are numerous here.

On Christmas Day we reached the banks of the River Caledon, and found it impassable. Rain continued and detained us till the 28th of January, though we made many ineffectual attempts to get across. Several other waggons were waiting on both sides. We spent the time, when the weather allowed, in shooting and skinning birds and animals, and collecting insects. The young rhu bok, which had been taken on Wolves Kop, died here. From the time of its capture, the creature had been ill on alternate days. One day it would drink milk and walk about, the next day the poor thing had no use of its limbs and appeared almost lifeless.

We were kept in constant uncertainty as to the period of our detention by the state of the river, which rose and fell accordingly to the weather, varying every few hours. The Boers who collected in great numbers, sent for a boat from Orange River and an active scene commenced, all hands busy in taking waggons to pieces and packing them in the boat. Eleven waggons, including ours, were sent across in three days, the current running so strong that many articles were inevitably lost. Our largest water-cask, though firmly secured, as we thought, was swept away and we never recovered it. The last day of January was occupied in putting our waggons together again and reloading them, and we also exchanged some of out barter goods for sheep and cows; the latter being essential to supply with milk the young animals we may catch. We had reason to rejoice at getting over the river when we did, a violent thunder-storm and heavy rain

coming on soon after, which would have rendered the passage impracticable. From hence we pursued our journey to a missionary station, called Thaba Uncha; the way was tedious, from the wet state of the country, and we repeatedly halted to rest the oxen. Great numbers of bless boks and black gnoos were observed; and our waggon was visited by people of the Barolong and Mantatie tribes, who all begged tobacco. It was the 16th of January when we reached Thaba Uncha. Mr. Gidde, the missionary, kindly promised to ask the chief, Moroco, to allow two of his people to accompany me, that they might take care of the oxen and sheep; and accordingly, I visited the hut of this potentate, to give him a present and request this favour. Our communication, which was very amicable, was held through the medium of a Hottentot, who had been educated by the missionaries near Cape Town. Some tea, tobacco and an English clay-pipe, quite won the heart of Moroco, who is chief of the Barolongs, and whose village contains 8000 inhabitants. The people possess great numbers of cattle, and raise much Indian corn and Kafir corn. They gave us a deal of trouble during the time that we were detained by bad weather at Thaba Uncha, tormenting us for presents, attempting to steal our sheep, some of which they succeeded in driving away at night, and setting their dogs on the quest for our provisions. The chief, Moroco, gave a long address to the men whom we engaged to accompany us, recommending obedience and diligence in our service; he much urged us to bind ourselves to return the same way, that we might bring his people back, and on Mr. Gidde's explaining that this might be impracticable, he stated that we must then write to him by the hands of the men, and say if we were satisfied with their conduct, else he should consider them as deserters. He added that the Barolongs never will remain with the Boers, but always run away from them; but that the English are his particular allies. Another present of tobacco then ratified the treaty, and we parted very good friends on the 19th. Three days after, we reached and

crossed the Fat River, where we stopped to get a waggon wheel mended, and to purchase horses from an emigrant farmer, named Hans Petersen, the first person of this class whom we have seen since we left the Caledon River, two months ago. The Fat River abounds with fish. Here we had a troublesome visit from a party of armed Boers, who came to the waggons, styling themselves military men. One, who claimed to be a cornet, insisted on knowing why we carried so much powder, and even wanted to take it from us, on pretence that we meant to sell it to the native tribes. After much blustering and abuse, during which he threatened to throw our waggons and all the goods into the river, the truth appeared; this cornet only hoped to extract a present from us, and finding it could not be got by rough words, he became very friendly and invited us to visit his house and see his wife.

An epidemic disease having carried off several horses, and rendered the others weak and useless, Mr. Zeyher left me to look at some, which Hans Petersen had to sell at a considerable distance, the place was called Doorn Kop. I remained near the banks of the Fat River till his return, and owing probably to the damp situation and stormy weather, I fell ill; but recovered gradually, and when Mr. Zeyher came back and reported that there was plenty of grass and many animals at Doorne Kop, which also seems a healthy spot, I thought it advisable to remove thither for a few weeks. The journey took a week. On the way, our best horse died suddenly of the prevalent malady; he had been feeding as usual, and was dead in a quarter of an hour. This disease causes great mortality in the neighbourhood, and I shall not replace the animal till it is absolutely necessary. Gnus, spring boks, and herds of the animal, called Burchell's quagga, were seen on the way to Doorne Kop; also a fine old lion, at whom I longed to have a shot, but he warily kept out of reach. One of our sheep actually lost its tail, which a jackal gnawed off the living animal. The farther we went, the more numerous became the tracks of animals, especially lions, black boks and hyænas. We halted

on a small hill near Doorne Kop, where we had plenty of wood and water and abundance of hares and guinea-fowls. It is useless to think of proceeding while the horses die so fast; fifteen, belonging to an emigrant farmer, have been carried off by the epidemic in one day. In a month, we were obliged to shift our quarters, having drunk up all the water for two miles round, and consumed our sugar and biscuit; so we removed to near the residence of a Boer, who has a hand-mill, with which our corn can be ground. On the 25th of April, we came to the Sand River and crossed it with much difficulty, and pursued our way among hills of a half desert soil, for several days. The tedium of the journey was enlivened by the herds of Burchell's quagga and spring boks; a large pack of wild dogs were seen pursuing the latter animals. At Rhinoster's Kop, which we reached on the 3rd of May, we collected many birds, white herons, *Ibis religiosa*, &c. The weather became gradually colder and frost prevailed at night, and sometimes snow. In a beautiful spring to which we went for water, I was charmed to find great quantities of *Water-cress* and *Veronia Beccabunga!* We continued travelling slowly, as the weather and state of our oxen permitted, to a small village inhabited by emigrant farmers, with one of whom we left our collections, in order to lighten the waggons. We were advised to call on the commandant of the district, whose name is Potgister; he has given us a note to one of his cornets, whom we shall meet at Macalisberg, whither we are going; but I should prefer to be without it, for whereas he pretends that our safety will be thus promoted, I feel convinced that his only motive is to extract presents, and to keep up an espial on our movements. On the 28th, we left Potgister, and commenced our journey towards Macalisberg. Wild boars and hyænas were numerous, and at night a lion prowled about and could not be driven away, even by keeping a large fire and letting off our guns, till he had seized one of the dogs, with which he went off. The carcase of a brindled gnu which we had shot, proved a great attraction to these

beasts of prey, and the howling they made was quite terrific. On the 1st of June, we arrived at Macalisberg, so named from its being the residence of the chief, Macali. The River Macali runs close by. Hartebeerts, lions and rhinoceros were seen in great numbers; also elands and hippopotamus. The fat of the latter animal is excellent eating. Punyer is a good shot and has killed many beasts; but if the carcasses are left for ever so short a time, either the natives or the wild animals are sure to destroy the skin, and render it unfit for preservation; and it is sometimes difficult to keep off the lions and hyænas. On one occasion we shot a fine female hippopotamus, and to lighten it, we opened and endeavoured to skin the carcass in the river, but we found it a most difficult job to get it from thence to the waggons; for the lions, attracted by the smell, kept near and pursued us for several hours. An alligator was also shot and skinned, and a buffalo; but the inevitable consequence of firing so many guns was to scare away the game from our neighbourhood.

On the 20th of July, an old Boer, who had accompanied us, was killed by a rhinoceros, and this circumstance, combined with the increasing scarcity of animals, has induced me to determine on quitting this place and going to a salt pan, distant about two days' journey. I shall take our two remaining horses and the cows which are in milk, that I may have a supply of food in case of meeting with any young animals. We have no salt left, so that a fresh stock will be acceptable. On the 27th of July, I took one waggon, with Punyer and all the people who could be spared, and proceeded towards the salt pan, which is situated in the centre of a small hill, and at least 500 feet deep. On the way we were much distressed for want of water. Giraffes abounded in this neighbourhood, and the Hottentot who attends the cows killed a fine large male, which gave us a long job in skinning him. The country is covered with species of *Acacia* and *Dodonæa* and *Euclea undulata*, a plant I had not seen since leaving Uitenhage. There are also several kinds of birds,

not found at Macalisberg, and large flocks of Guinea-fowl and pheasants. Having sent two of my people to shoot buffaloes for meat, they disturbed a rhinoceros, which chased them; the poor fellows hurried to a tree; but the infuriated beast followed so closely that they had not time to ascend it, and in utter despair, they both fired at once, and their huge foe dropped down dead. Having no meat at the waggon, they brought home all the flesh of it they could carry. Rhinoceros meat, when fat, is almost equal to beef; but when lean, is nearly uneatable. I was very sorry to miss killing a panther, which passed close to me while I was busy looking for birds, but the shot in my gun being small, I dared not meddle with him. About twenty natives, and twice as many dogs belonging to them, keep hanging about our waggon. I made them very happy with the giraffes, and carcase of the buffalo we had killed; and if these poor creatures were not allowed to feast on the meat, the wild dogs and hyænas would soon secure it, for not the most careful concealment with bushes and thorns, nor good fires burning round the spot, are sufficient to scare the ravenous beasts from such a repast. Many a time, the creatures we have shot were pulled away and devoured before help could be obtained from the waggon to secure them. A young female giraffe, which one of the Hottentots caught, became a troublesome but interesting charge. She was about seven feet high, very wild and strong, and after being tied all day to a tree, we were obliged to stand by the whole night, or she would have strangled herself in fruitless efforts to escape; and when we wanted to feed her, the only mode was to fasten all her four legs and laying her gently down, to compel her to swallow some milk. Two cows did not give milk enough to supply her, and her unruly struggles prevented her being left alone, night or day. I covered her with one of my blankets, the cold nights appearing to disagree with her, and after two days we made our way back to the waggon, that we might get more milk for her. She had begun to eat *Acacia* leaves, and was growing tamer, when

as we were occupied in preparing some eland's flesh for supper, the unlucky animal contrived to get loose, and darting off in the dark, effected an escape after five or six days' captivity, and though we pursued her track for several hours, it was all in vain.

(*To be continued.*)

Notes on the VEGETATION *and general character of the* MISSOURI *and* OREGON TERRITORIES, *made during a Botanical Journey in the State of Missouri, and across the South Pass of the* ROCKY MOUNTAINS, *to the Pacific, during the years* 1843 *and* 1844; *by* CHARLES A. GEYER.

(*Continued from p.* 662, *Vol. IV.*)

IV.—The Sandy Desert Region comprises the eastern portions of the Sierra Verra, Sierra de los Grallos, and Sierra de las Mimbras. Like the preceding saline barren region, this is without any limits, but is partly intersected by spurs of the Rocky Mountains, by saline barren lands, or, the least part of it, by subfertile gravelly plains or ridges. About one-half of Missouri and Oregon territories belongs to this region, as well as one third, or one-fourth, of the State of Arkansas; its boundaries westward pretty well keep the same lines with the Saline region, but it diverges out of those limits eastward, reappearing in the territories Dacotah, Iowa, Wisconsin, and the northern part of Illinois to Lake Michigan. Most part of this eastern prolongation does not belong to what may be properly termed desert, but rather Poplar, Oak, or Pine barrens. These, as well as the other great half of this region, on the west of the Rocky Mountains, will be described later, under separate heads.

The apparent geological features will be noticed separately, since, on account of the different altitudes, this region must be again divided into four sub-regions.

General character of the vegetation.—Westward, fronting and encompassing part of the great region of the *Coniferæ!*

In the narrow river-valleys, are oases of Poplar with thickets of Willows, *Amorpha frutescens* and *Rosa!* Rarely is found a thicket of *Shepherdia argentea*, *Elæagnus*, *Ribes aureum*, and *Rhus trifoliolata!* In the desert plains, oases of *Populus betulæfolia*, Pursh, without undergrowth, are very rarely met with!—Apparent centre of the *Astragalinæ* of North America! — of the *Compositæ*;—*Anthemideæ!*—Shrubby *Artemisiæ* and *Chrysocomæ!*—*Avenaceæ*; *Festucaceæ* and *Hordeaceæ*, most abundant in the genera *Stipa* and *Eriocoma*, *Festuca* and *Kœlera*, *Triticum* and *Elymus!*—*Heliantheæ*; *Hieracia*; *Inuleæ* and *Ambrosiaceæ* likewise abundant among the *Compositæ!*—The next numerously represented families are *Onagreæ*; *Cacteæ*, and *Boragineæ!*—Less numerous, yet abundant in but few genera and species are, *Cruciferæ*, *Turneraceæ*, *Apocyneæ*, *Polemoniaceæ*, *Scrophularinæ*, *Pediculares*, *Polygoneæ*.—Rare are *Eleagneæ*, *Agrostideæ*, in the genera *Polypogon* and *Crypsis!*—*Cyperoideæ* in divers species of *Carex!*—*Labiatæ* in the genera *Monarda* and *Hedeoma!*—*Polemoniaceæ* in *Cantua*; *Collomia!*—*Rosaceæ* in *Rosa*, *Purshia*, and *Potentilla!*—*Turneraceæ* in *Bartonia!*—Single representatives!—of *Rubiaceæ*, *Galium septentrionale!* of *Papaveraceæ*, *Argemone!*—of *Fumariaceæ*, *Corydalis!*—*Euphorbiaceæ*, *Euphorbia!* *Liliaceæ*, *Calochortus*, and of *Amaranthaceæ*, *Amaranthus nanus*, Nuttall!

The peculiar characteristics of this Flora consist in the perennial foliage of most of the shrubby *Compositæ*, and the great number of succulents, chiefly *Opuntia Missurica*. Annuals are very few, of rapid growth, early decay and inconspicuous; with few exceptions; consisting of humble *Caryophylleæ*, *Polygoneæ*, and *Boragineæ*. Half the biennials likewise decay in the early part of summer, as soon as they have done blooming; these are species of *Townsendia*, *Œnothera*, *Erysimum*, *Apargia*, *Cantua*, &c.; the other half continue green, and even blooming, till late in the fall, as different species of *Hymenopappus*, *Cynoglossum*, *Bartonia*, *Argemone*, as well as a few annuals, (*Cleome*, *Castilleja*, *Collomia*).—The shrubby *Compositæ* flower late in September

and October, when the others of that great family are scarcely over. *Gaillardia* is the first and the last. All other plants have done blooming about the middle of August.

An ashy, dull, scanty, green is the prevailing colour in the desert, and an ochre-yellow almost as dull as the drifting sand itself, more so when the *Artemisiæ* are in bloom. Vivid hues appear only on firm sandy plains, for a very short series of days, during the latter part of June. In fertile valleys the green is very deep and rich, and the colours reversed, that is, the dull yellow prevails in the spring in different species of *Crepis, Sonchus,* &c., and the vivid colours about the month of September. All trees and shrubs have grayish foliage, at least, ashy bark, and retain their leaves till the beginning of November.

1*st Sub-region.*—Highest, cold and firm sandy table-lands, on the depressed central chain of the Rocky Mountains, about the uppermost sources of Missouri River.

This is the most northern part of the Sierra verra or Green Desert, cold and inhospitable, though less so than the great tracts of sandy desert lower east. A succession of table-lands rise continually and imperceptibly north-westward from the uppermost forks of the Colorado of the west. The narrow valleys also rise at least in the same ratio and expand at the same time to a very great width; the plains become rock-bound, narrower, and either mountainous, towering, capped with perpetual snow, or more frequently truncated at a considerable height, (about 5000—6000 feet of elevation). These plateaux and the extensive valley plains constitute this sub-region.

In very few localities are the lower strata visible; the most conspicuous I found about Madison Forks, consisting of a chasm in a great sandy plain, several miles long, showing massive, horizontal strata of a compact smoky-white clay-stone, with a deep blueish fracture, becoming white and dusty when exposed to light: the upper strata were lighter and were overlaid by a thin strata of very heavy black iron-stone, with a close-grained crystalline fracture, and a porose

coke-like surface: the same mineral appears on the Sweet-water River and Soda-springs, and nearly the same in the shape of extensive dykes, in the Black Hills and other eastern ranges of the Rocky Mountains.

Again, the same species of rock assumes in some localities a somewhat obsolete columnar form, when it is less heavy, and not so distinctly crystallized, walling sides of plateaux, 1000—2000 feet in height above the wide valleys, but only around their base; higher up, the same claystone or clayey sandstone appears again, with a slight southerly inclination and confused surface. These stony table-lands are the habitat of *Stanleya viridiflora*, *Sida dissecta*, *Mammillaria*,* *Castilleja*

* This *Mammillaria* is one of the largest in size among the *Conothelæ*, and like another species of the same division from the sandy plains at the uppermost forks of the Platte, always solitary and with yellowish-white spines. Both species were lost, I regret to say, but I hope that future travellers will again find them. The first I noticed in my journal as *M. applanata*, having somewhat the form of *M. depressa*, and very small lurid-reddish flowers. The one from the Platte-plains is small in size, somewhat pear-shaped, with very dense and closely radiating spines, which cross each other; the flowers likewise small, rose-coloured. It was first discovered by Dr. Mersh, of Luxemburgh, in the suite of Sir Wm. Stewart; so I noted it down in my journal, as *M. Mershii*. A third species of *Mammillaria* I found on the Oregon plains, while searching for a *Melocactus*. Of this I brought dry specimens to London, and Mr. Scheer, at Kew, has already raised several from seeds. The above mentioned *Melocactus* was gathered by Chief-factor Macdonald, at Fort Colville, but the exact habitat was forgotten; the one specimen found was afterwards in possession of Dr. Tolmie on the lower Columbia. From the information I could gather at Fort Walla-Walla, the true habitat of this *Cactus* is at the "Priests' Rapid," on a rocky island in the Columbia River, about sixty miles above Fort Walla-Walla. I received the intelligence too late, but hope that by publishing it, other botanists may have the opportunity of getting the plant without loss of time.

A circumstance seems to me to deserve some notice respecting the above three *Mammillariæ*; they become buried by sand and dust at the approach of winter, so as to be hardly visible; even in the summer months they scarcely show more than one-third above ground. This seems, indeed, a provision of nature to protect these tender succulents against the intense cold of so high a latitude and altitude. Such is not the case with

111, *Helianthus* 34, *Chrysocoma* 63, *Galium septentrionale*, *Erysimum asperum*, *Purshia tridentata*, *Pentstemon pusillum*, and 238, *Gymnandra* 230; sometimes with a poplar grove occurs on the sloping side, of P. *betulæfolia*, and a dense carpety undergrowth of *Myginda myrtifolia*. There is no trace of saline soil on these table-lands, not even at the bottom of the chasm in the plain above mentioned; it is the more remarkable that I found several saline plants on the former, as *Atriplex argentea* and the above *Stanleya*. *Sida dissecta* deserves to be noticed as one of the handsomest of the genus, far more brilliant in colour than *Sida coccinea*. The others are common plants, already mentioned or occurring in other localities.

M. simplex and *vivipara*, which remain firm above the hard gravelly surface, or granite rock. There is, however, a great difference in the seasons, which is in favour of the latter two, while the former are yet covered with deep snow; these are already vegetating (May), and about the middle of June the pulpy fruit is already coloured, on the growth of the same spring; so that the plant has the whole long summer to harden its texture for the very severe winter. Those in the higher altitudes are scarcely in bloom (beginning of September), when snow-storms have already set in, therefore the fruit has not time to ripen the same year, and the fructification is, so to say, biennial, or on the growth of last year.

Among the *Opuntiæ* is the *fragilis*, Nutt. the lowest and not seldom covered with sand, but it also occurs on firm soils, though a prostrate species; the same is the case with *O. vulgaris* on the granite rocks in the neighbourhood of New York, and in the Sandy Oak-barrens of Northern Illinois, near Beards-Town; *O. Missurica* remains erect and quite firm.

The *Mammillariæ* afford quite a seasonable refreshment in the Missouri Plains; though only during the time of growth while the fibres are tender. In taste they resemble raw cucumbers; the same may be said of the young shoots of the *Opuntiæ*; the latter, however, proved a great annoyance to the travellers, especially as there are no other shoes worn in that part of the wilderness than of buck-skin; they are more easily avoided by day, but it is quite impossible to move about at night, even horses get lamed by stepping carelessly in these thorny bushes. In the month of June they show their large bronze-yellow flowers in abundance, which are only open during noon-day hours; and in warm weather the stamens evince the same irritability as those of *Berberis* and *Sparmannia*. On the uppermost waters of the Colorado, in a great desert, I found a species of *Coccus* inhabiting this *Cactus* copiously, the insect was in every respect like the *C. Cacti*, but large.

The spring Flora seems to consist of a low species of *Phlox* and one or two dwarf prostrate *Caryophylleæ,* not unlike *Lichens* at the first glance; these are, amongst others, *Arenaria?* 143, and *Stellaria?* 144, and *Cantua?* 480.

2nd Sub-region.—Less firm, sandy plains, traversed by extensive detached granite mountains, on the uppermost waters and sources of Platte River.

The detached granite mountains are the only geological character of note within this sub-region, and will be noticed among the intermediate regions hereafter. The sandy plains differ from the great deserts, in so far as they are locked between those mountains, more level and gravelly.

The Botany of these plains is interesting, rich and quite brilliant in comparison with the surrounding country. Most of the river valleys belong to the Saline Region. Here is the centre of the *Astragalinæ*; at least, I found them nowhere so abundant and ornamental. The most elegant is *Astragalus,* n. 21, growing in large bushes about 18 inches high with great numbers of purple racemes, a variety of it has rose-coloured flowers. Two other still more bushy species, Nos. 50 and 59, have milky-white racemes, the latter silky-villous herbage. Here grew also *Astr. assurgens* and *caryocarpus,* and most of the other species of *Astragaleæ* were collected in these plains, as Nos. 39, 74, 108, 120, 125, 126, 127, 161, 166, 223,* 256; *Psoralea glomerata* and *Sophora argentea.*

Besides the scattered shrubs of *Purshia tridentata* are *Pentstemon speciosum?* (117), *Œnothera albicaulis, Helianthus petiolaris, Asclepias speciosa, Crucifera* 134, and *Cleome integrifolia* with *Artemisia* 668, the most conspicuous plants in height, besides the afore-mentioned *Astragaleæ.* The rest are a great variety of low, but elegant plants, as *Artemisia frigida, Lygodesma,* 43 and 156, *Calochortus,* 68, *Leguminosa* 123, *Labiatæ* 91 and 124, *Cynoglossum* 360, *Eriog*

* This plant is abundant on the saline sandy ridges of the Upper Missouri. The Teton-Sioux Indians dig for its sweet root, which seems to surpass in sweetness that of the common liquorice.

num 661, *Arenaria* 26, *Anthemidea* 6, *Apargia ?* 40, *Cantua ?* 25 and 42, *Pentstemon* 154, *Linum* 169, *Œnothera* 175 and 176, *Crepis* 179, *Diplopappus pinnatifidus, Erysimum asperum, Œnothera coronopifolia, Plantago gnaphaloides, Solidago, Stenactis, Antennaria* and other more common plants. *Orobanche fasciculata*, springing from the roots of *Artemisia frigida*, is here very abundant.

Of rare plants, growing in peculiar localities: *Bartonia* 365, from the arid slopes of the high plain to the Platte Valley; *Asterea* 277, near Fort *Laramie*; *Cyperoidea* 54, with a *Psoralea* 169, which seems distinct from *P. esculenta* and probably is *P. hypogæa*, Nuttall; of which I only found one specimen.*

3rd. Sub-region.—The sandy deserts alternate with the largest tracts of saline deserts, and are based on the same whitish, firm clay, which forms the crested surface of the latter. The moving beds of sand, however, have an undulated and ever-changing surface, as every where else.

The deeper these drifting sands, the higher are the *Artemisia* bushes, the chief character of this sombre vegetation; they consist of two species only, *A. cana* and *tridentata*. The largest and oldest shrubs assume the shape of a small tree about 8 feet high, with a short twisted trunk 4 or 6 inches diameter and very broad crown. Dispersed among these bushes are one or two species of *Chrysocoma*, corymb-branched greyish shrubs, not exceeding 2 feet in height, especially n. 63. The few scattered grass plants are either *Eriocoma*, *Kœlera*, or species of *Stipa*; towards the Oases occurs the tall *Elymus* n. 541. On elevations the shrubby *Compositæ* make room for *Opuntia Missurica*, which occupies immense ranges, to the no small annoyance of the traveller,

* The distribution of plants over the whole of the plains east of the Rocky Mountains is in a narrow, somewhat semi-circular belt, from north to west south-west; so that the traveller may pass in one day through one or two of such belts, never to see the same plants again in his journey. This is most observable in the case of the rarest species, as *Bartonia ornata, Stanleya pinnatifida, Schrankia* and others.

and forms large circular patches, and little less than 2 feet high. Amongst this *Opuntia*, grow most of that limited number of herbaceous plants which occur here; the *Astragaleæ* 1, 2, 22 and 106; *Epilobium* 45 and 3; *Œnothera albicaulis* and *coronopifolia*; *Calochortus* 68 and 609; *Hymenopappus* 141, 142, 214; *Eriogonum annuum?* 151; *Phaca* 106; *Cynoglossum* 186 and a number of small annual species which were already withered; *Bartonia parviflora* n. 663 and 368; *Castilleja*, n. 511; *Erysimum asperum; Helianthemum petiolaris; Hosackia Purshiana*, very abundant every where; small shrubs of *Iva axillaris*, (rare); *Oxyria?* n. 162, (rare); *Œnothera* 647, (rare). The following plants grow in groups by themselves: *Phaca* 1; *Phaca* 22, rarely solitary, with long, very slender creeping roots, binding loose sand-hills; *Cynoglossum* 186, and the delicate *Epilobium* n. 3. The curious annual, n. 80, grew in abundance on the deep sands between Colorado and Bear River. A few other herbaceous common plants are here also to be found, as *Œnothera biennis, Erigeron Canadensis*, and others as by accident from the neighbouring regions.

In the *Artemisia* bushes (wild-sage-plains of the Anglo-American travellers) lives a beautiful gallinaceous bird, the so-called "sage-cock" (*Tetrao urophasianus*); as grey as the *Artemisia* itself, and the flesh of it as bitter too. It assembles in little flocks, seldom more than eight or twelve together, and lives, at least, generally, on the *Artemisia* leaves. The desert region about the great Salt Lake is the Sierra de los Grallos of the New Mexicans, or Grasshopper Desert; containing great part of the country of the Shoshonies, Bannak and Eutaw Indians, tribes ever on the move and in the saddle, amongst whom are some of the best horsemen in the world, especially the famous Shoshonies* or Snake Indians and the Eutaws. The Bannaks, a

* Those individuals who would enjoy seeing true and well-finished sketches of scenes and scenery of the life and country of this remarkable tribe of Indians, I recommend to apply to the liberality of Sir Wm. D. Stewart at Murthly Castle, Scotland; who has, at enormous expense,

related tribe to the Shoshonies, however, have almost nothing of the skilful horsemanship of their cousins; but live the most wretched life of any Indians in the West. They are generally designated "Root-diggers" and are very well described by Captain Bonneville. Oftentimes, when they can get neither game nor roots to live on, they eat grasshoppers; a species of *Gryllus*, very large and fat, of every shade of brown and black, wherewith these deserts abound. For this purpose they are caught in large quantities, boiled alive without ceremony and eaten like craw-fish. It is said that the soup of them is very sweet and a favourite drink; even gentlemen of the Hon. Hudson Bay Company, who had been compelled to live on it, spoke to the same effect. In case of scarcity of such grasshoppers, the Bannaks make soup of a large species of ants, which abounds towards the uppermost waters of the Arkansas River, and further south in the Sierra de los Mimbras, Upper California and Texas. Few quadrupeds exist in the wide deserts; antelopes may have been abundant once, now they are very few in number and so shy that they never come within rifle-shot. A middle-sized species of hare, white with a black tail, dwells in the neighbourhood of the Oases, but is very rare. Small birds are scarcely seen.

It is hardly necessary to say anything about the difficulties the traveller has to endure traversing these wide deserts. Want of water and of game, and the hot noon-day sun, are rather trying; but still not worth while mentioning, for the ever-bright sky and the cool nights make ample amends for them. The atmosphere is pure and exhilarating, so that if there is no want of food in the camp, I am sure every traveller will be disposed to number those days among the best on the long journey, not forgetting the wild blazing camp-fires of *Artemisia* bushes.

enriched his collection of paintings by a great number of sketches, taken on the spot, partly by himself and partly by able artists, during his repeated visits and long stay among the Shoshonies. They are as true as nature itself.

Following upon the cursory description of Missouri territory, will come the

V.—Mountainous, or Intermediate Region, dividing naturally into three more or less distinct groups, as:

1*st*. *The great Rocky Mountain chain* in connexion with the Wind-river Mountains;

2*ndly*. *The range of the detached granite mountains* on the uppermost different forks or arms of the Platte; and

3*rdly*. *The Black Hills, or Black Mountains,* in connection with the hills of the north and south fork of Platte River.

The apparent geological features follow in form of a synopsis; stating the different characters and compositions recognized, from the great central chain down to the Missouri limestone near the mouth of the Platte.

1*st*. *Central chain and Wind-river Mountains*; the

A.—Highest; consisting of hard granite, bluish or whitish, rarely reddish, in very steep or nearly vertical layers; here and there forming high peaks. Surface smooth, marked by cracks into large, mostly irregular, often somewhat rhomboid blocks; the grain dense and even. Parallel with, or radiating off from these are:

B.—Lower mountains of the same granite, but with a rough surface, divided into loose masses or vast blocks, which likewise have sometimes a rhomboid form; sometimes with nearly horizontal layers at the base, but always divided, as if rent by a shock. The basilar blocks are not unfrequently of a coarser grain, laminated, whole parts consisting of large feltspar crystals. (A common variety of granite occurs on the western slope of these mountains;) alternating with these are:

C.—High oblong edge-topped mountains, of syenitic granite; their average height about 1500 feet. Their surface is so broken to small somewhat wedge-formed fragments, as to resemble artificial heaps of stones. They are traversed by vast dykes of dense basaltic rock and greenstone; of a blackish colour, firmly connected with the heterogenous masses, and have, at the lowest, an (easterly) inclination

of about 80°, but are, for the most part, quite vertical. By following so close upon each other, these dykes give these mountains a striped appearance. These ranges occur again in the third group, and are separated by firm arenaceous plains from the second. At the south-eastern confines, at least on this route, occur high

D.—Mountainous ridges, which on one side show escarpments, fronting defiles and narrow river-valleys. These fronts exhibit the first pseudo-columnar basalt, of an earthy fracture, but with an ore-like hard surface. Above, are strata of black iron-sandstone, very heavy, orelike, and densely grained. This is, perhaps, the magnetic iron-stone, mentioned by Captain Fremont as occurring at Sweet Water River. This basalt, which is of a pentagonal form, occurs frequently further west, walling high plains or declivities, but has then a porous crust-like surface.

2nd group, or *Detached Granite Mountains* on the uppermost forks, or different arms of the Platte River; they seem to be the summits of mountain chains; are remarkably smooth and rounded, less so, however, towards the south-west. Their inclination is various, increasing upwards with every successive layer westward, until they become vertical and inclining again.* The granite itself is in every other respect like that in the mountains; A.—The first locality on this route is at the Sweet Water River, and commences with Rock Independence.

3rd group, comprising *the Black Hills, or Black Mountains,* with the hills of the north and south forks of Platte River. Consisting of:

A.—Mountainous masses of conglomerate, without order, but always deeply reclining on their still higher syenitic or pseudo-basaltic ranges, which have broken through the body of this vast group, and are thrown in confusion. In its

* The low smooth granite masses which lie exposed along the upper, have the same inclination, which are likewise syenite, but unbroken for a short space, afterwards overcast again by pieces.

white calcareous cement, this conglomerate includes fragments of primitive rock and of secondary, all rounded and smoothed, from the size of small pebbles, to one or two feet in diameter. This conglomerate makes up the mass of the Black Hills, their centre being, as has been already stated, syenitic ranges. A very different, and:

B.—Low range of hills occurs at the end of this, or near the detached mountains, based on, and overtopped by the iron sandstone, the latter again leaning on syenite and granite. This range of hills, known by the name of "Red Butts," is composed of blood-red sandstone, intermingled with micaceous clay of the same colour, forming a curious front of sundry rounded cupola-like corners and high vertical escarpments.* The conglomerate is in some localities above, but ordinarily below the

C.—New sandstone. A very extensive stratification which constitutes most part of the hills and mountains of this group. When undisturbed, it lies strictly horizontally; is found often imbedded, as a thin layer, in ferruginous sand or shale; is coarse-grained, with an indifferent friable argillaceous cement, and of a dirty-white or brownish colour. Its highest localities are the high plateaux about the sources of Missouri, where it has been lifted up by basaltic rocks from beneath. It occurs fantastically-shaped, in obelisks, towers, castles, &c., by the effect of weather, as for example, the "Chimney" on the Platte, or the immersed sandstone ranges in the shape of ruins of cities on the Upper Colorado. Finally, it alternates sometimes, as has been stated, but generally overlies the

D.—Vast stratified beds of carbonaceous bituminous

* Part of the valley near these escarpments is cavernous, as the sound of our horses' feet sufficiently indicated. Evidently the red colour was imparted to this sandstone by heat. The clay banks and clayey sandstone rocks opposite were likewise heated for a considerable distance, even the banks and bottom of a small rivulet, as the red colour and baked appearance of the clay sufficiently indicated. The other portions of the valley are wider, and are saline meadows.

shale, which form, for nearly a thousand miles, the right and left banks of the Missouri River, or the hills of the river-valley, spreading thence north and south, to California and the country of the Hudson Bay. Vast beds of 100 to 200 feet depth, without any manifest change of strata below, may be seen in the labyrinthian defiles, mentioned in the saline region. Though these strata very frequently incline towards ravines and river-valleys, still a slight north-easterly general inclination is likewise apparent. Often, they are for miles capped with flat conic heaps of heavy ferruginous loam, strewed over with burnt bones, organic remains; (Orthoceratites, Ammonites, fishes, reptiles), also pumice-stone of white, grey, and yellow or red colours: sometimes there is a layer of the sandstone between the loam and the shale. Beds with escarpments, when freed from pressure, crumble to heaps; when at the same time exposed to the sun, in that state, they are combustible; otherwise, they filter a brownish water, strongly impregnated with salts. Thin layers of impure chalk occur at great depth; cakes of crystals of gypsum on the top, and of sulphuretic iron abundantly throughout. The shale is dark stone-colour at first, becoming slate-bluish afterwards; it divides into thin laminæ, with an earthy fracture of brownish, afterwards ashy colour. This formation includes the "Burning," or "Burnt Hills" of Lewis and Clark, and vast portions, according to the statements of the Indians and hunters, have been burning for many months. Between this and the Missouri limestone formations occurs, finally

E.—A massive bed of bluish or whitish argil, as if cast between the two formations. Great part of the Lower Platte Valley is overlaid with it, and near the obelisk, or the "Chimney," close to the junctions of the south and North Forks of Platte, the same forms rounded aggregations. It is widely spread over the surface, underlies the sands of the deserts, as well as those of the Lower Platte. Mixed with the loam of the river-valleys, it imparts great strength to the soil and vegetation on account of its calcareous particles. The same(?) argil appears again as an imbedded layer, from 30-40

feet of thickness, in the water-rent banks of the Missouri at Council Bluffs.

We have now arrived again at the sandy barrier of Lower Platte Valley, which consists most probable the decomposed strata of carboniferous sandstone, formerly overlying the horizontal limestone of the Missouri, which we saw last as the bed of Grasshopper River, a small stream, tributary to the Kanzas River, about 120 miles S.W. from the mouth of the Platte.

We will now retrace our steps, and follow these hills and mountains up again to their respective centre, for the purpose of taking a view of the Vegetation.*

Commencing at that place, we are at the southern boundary of the *Triticum Missouricum*, a glaucous *Graminea* spread over plains and mountains of Missouri and Oregon territories, down to nearly the edge of the coast of the Pacific. A little further, and we have already left behind us the last fertile lands of the Missouri, and stand on the sandy barriers of Platte Valley again. (Passed through the belts of (*Pentstemon grandiflorum*, *P. dubium*, *Œnothera*, 268.)

From hence, following the sand-hills and escarpments

* It may safely be asserted that much more is known about the vegetation of Oregon and California than that of this mountain region. Most botanists have not the means to equip expeditions of their own, and are obliged to attach themselves to caravans of traders, missionaries, or emigrants, who move onward without loss of time, passing rapidly most striking portions, to stop, perhaps, for a day or so only, at the least interesting. The great number of new plants which Captain Frémont found on the Wind-river Mountains, prove sufficiently that he must have been the first explorer. Not less a rich collection of new plants could be made by an exploration of the "Black Hills," difficult and perilous though the undertaking would be. From that quarter we may yet look for a number of species of *Eriogonum*, perennial *Bartonias*, prostrate *Phacæ*; dwarf Cruciferous plants, as *Leavenworthiæ*, *Thlaspi*, as well as *Stanleyas*, ligneous *Œnotheræ*; *Sidæ*, *Thermiæ*, *Lygodesmia*, &c., &c., and some new species of Pines and *Juniperus* may also be expected. For *Pinus flexilis*, mentioned lower down, I have the authority of Dr. Mersh; it is said to be the most slender of all the pines, producing merely poles of about 60 feet high, with short twisted branches. I myself saw it only at a distance, growing in small groups.

of the adjoining gravelly plain, we cross the South Fork of the Platte, (lat. 41° 14′), pass over high sterile plains, and arrive at the northern arm, passing the "Chimney,"* the argillaceous hills, and Scott's Bluffs,† we stop at Fort

* The Chimney is an elegant natural obelisk of new sandstone, visible at a great distance, and said to be 350 feet high. In the Report of Captain Frémont there is a good lithographed drawing of it.

† Scott's Bluffs, a solitary truncated sandstone rock, in the shape of a fortress, showing two precipitous fronts towards north and east of about 500 feet in height, its western sides connected by deep ravines with the other sandstone ranges. It is the most westerly of a whole series of grotesque rocks, disposed in an almost complete half circle, fronting the wide valley of the Platte, wherein Sir Wm. Stewart had struck his camp. On the following day, Sir Wm. Stewart desired Dr. Mersh and myself to take a special survey of Scott's Bluffs, where we had an opportunity of witnessing a curious meeting between the grizzly bear and antelope. Returning from the survey, we two separated from three other companions, and rode down to the banks of the river, where we watered our animals and allowed them to graze for half an hour. Mounting again, we at once observed a grizzly bear about sixty yards from our right, who, observing us, distanced himself a little more, and, always keeping his eyes on us, followed us for a short distance, when, to our astonishment, another came, who, a little ahead of the former, likewise followed us at the same distance, watching us closely. We trotted on as fast as our horses could go, but the bears also accelerated their pace, gaining on us at the same time. It was with difficulty that I prevented Dr. Mersh from firing, he being unacquainted with the revengefulness and ferocity of that animal; and an attack on our part would have been almost certain death, for Dr. Mersh had but one gun, and myself a brace of pistols; our animals, too, being already tired. The two bears, however, had no ill intentions, but seemed impatient to get out of our way; to that end they mended their pace, and gaining upon us, they soon crossed our path some distance ahead of us; their eyes still upon us; they then reached an elevation, upon the brow of which there suddenly appeared three antelopes, who stopped short in their swift course as soon as they recognized the two monsters. The next moment they commenced cutting every sort of caper, as young goats do, and all at once, as if at a signal, they all three rushed and passed the bears, still capering, so closely that the latter could have struck them down at once. The bears, however, took no notice of their folly, and trotted heavily onward. Three or four times the antelopes this manœuvre, to the same effect, exhibiting every possible caper and repeated grimace so peculiar to their tribe. Presently the bears gained the height,

Laramie, the eastern limit of the shrubby *Artemisiæ*, the beginning of the deserts. At the crossing of the South Fork, we parted from the last scattered groves of Oak in some ravines, where already the *Juniperus Andina* had made its appearance, which becomes a little more frequent towards the Black Hills, where it associates with *Pinus resinosa* and *P.* (*flexilis*)? On the argillaceous hills near Scott's Bluffs, I found *Vesicaria didymocarpa*, *Œnothera cæspitosa*, *Œnothera*, 16, *Pentstemon cristatum* and *Townsendia*, 49; also *Kentrophyta*, 74, with the prostrate *Phaca simplicifolia* and *ternata*. This is the region of the genus *Phaca*, and the dwarf species of *Phlox*, and *Arenaria*, 143 and 144, the high plains being covered with them in the neighbourhood of the sandstone stratas. This is also the habitat of *Shepherdia argentea*, growing both on the cliffs with *Ribes aureum* and *Rhus trifoliolata*,* and along the river banks. On the cliffs near Fort Laramie, I found *Composita*, n. 32, *Lygodesmia*, 43, *Cynoglossum*, 89, *Artemisia frigida* and *Lewisii*; *Pentstemon*, 117; *Thermia*, 224; *Purshia tridentata*, *Eriogonum*, 241; *Senecio Balsamita*; *Euphorbia*, 261; *Thlaspi?* 267; *Fritillaria*,† 271; (in fruit, only seen once in a ravine of Scott's Bluffs); *Caryaphylleo*, 143 and 144; *Pentstemon*, 155; *Eriogonum*, 158; *Onosmodium*, 164; *Phaca*, 166, 171; *Crepis*, 180; *Senecio*, 202; *Guttierezia Euthamiæ*, *Erigeron*

from whence they turned back to their den in Scott's Bluffs. This region abounds in bisons, which, like the elk, move in large herds, or bands. Antelopes also go in large flocks; the cliffs harbour the big-horn, or mountain sheep. The number of rapacious animals is likewise great, and more than in proportion.

* The somewhat viscid berries of *Rhus trifoliolata*, Nuttall, are eaten by the Indians and hunters. They have an agreeable sour taste, a little aromatic, much like those of *Rhus aromatica*, Pursh. The shrub grows from 6-8 feet high.

† This seems to be a very rare and handsome plant. It grows abundantly in the deep long ravine leading off from Scott's Bluffs, up the river, to the left, close to the Bluffs, in white clay. It probably flowers in the middle of June, the fruit was almost full grown on the 2nd of July. One bulb out of four I brought to Kew Gardens showed life.

hirsutum; Trifolium, 105. (Passed through the belts of *Mamillaria simplex*; *Rumex venosus*; *Liliacea*, 20; *Phaca*, 22; *Arenaria*, 26; *Lupinus pusillus*; *Œnothera* (37) *pinnatifida*, in whose stead appears *Œnothera*, 38; *Coreopsis tenuifolia*; *Psoralea canescens*,* *Petalostemon violaceum, candidum*, and *villosum*; *Malva*, 76; *Hymenopappus corymbosus*; *Allionia multiflora*; *Calymeniæ*; *Œnothera serrulata, Macranthera, Linum rigidum?* 169; *Psoralea*, 223: *Evolvulus*; *Ferula fœniculacea*; *Phlox*, 88; *Labiata*, 91; *Potentilla striata*; *Leguminosa*, 123; *Labiata*, 124; *Ferula*, 129; *Erigeron*, 140; *Leguminosa*, 2; *Sesleria dactyloides*; *Aristida pallens*; *Polygala alba*; *Gnaphalium*, 279; *Vesicaria*, 278; *Verbena bracteosa*; *Solanum triflorum*; *Calliopsis bicolor*; *Œnothera*, 647; *Pentstemon*, 662; *Yucca angustifolia*; *Lippia cuneifolia*, *Œnothera*, 178.)

About two or three days' travelling from the latter place, through wild and picturesque scenery in that range of the Black Hills, we arrive at the red strata or Red Butts; where we first meet the broken syenitic mountains. At the foot of one of them I discovered a small tree, about 15-20 feet high, with the habit of *Clethra alnifolia*, but without fruit or flowers, n. 195, (probably a sp. of *Cratægus*). Here also I found *Heuchera*, 118; *Eriogonum*? 145; *Purshia tridentata*; *Artemisia tridentata*; (for the first time,) *A. cana*, commencing at Laramie River, *Potentilla*, 249; *Scutellaria parvula*; *Spiracea*, 576; *Eriogonum*, 661. *Hedyarum*? 71.

On this narrow belt occur a great number of plants, the

* *Psoralea canescens* ceases here, as well as its constant companion, the useful *Ps. esculenta*, Pursh. The latter is the most abundant, but becomes more and more thinly scattered towards the north, and ceases on the lower Saint Peter River, at Traverse des Sioux. The same locality is, on the contrary, the place where the *Psoralea canescens* is the most abundant, which latter becomes more and more thinly scattered south-westward, until at Fort Laramie, at least near it, it is very rare, and disappears at last with *Ps. esculenta*. Another very much allied species, however, takes the place of the latter, but very sparingly, (probably *Psoralea hypogæa*, Nutt.,) after which, I noticed not another species of this genus east of the Rocky Mountains.

first and last time to the botanist; though I am sure that other botanists, not being obliged to pass through so hastily as I was compelled to do, would, on the same route, find a great number more. The following are a few of them: *Phaca*, No. 1; *Phaca?* 3; *Erigeron*, 27; *Arenaria*, 36; *Oxytropis*, 39; *Viola*, 41; *Cantua?* 51; *Gaura*, 55; *Homolobus*, 56; *Stanleya pinnatifida*; *Chenopodiacea*, 64; *Potentilla*, 69; *Eriogonum*, 15; *Silene*, 49; *Phaca*, 106; *Eriogonum*, 139; *Lygodesmia*, 156; *Œnothera*, 175 and 176; *Senecio*, 202; (*Crepis*, 222)? *Orchis*, 233; *Siliquosa*, 234; *Phacelia*, 243; (*Astragalus*, 256)? *Lobelia?* 263; *Erigeron*, 277; *Populus*, 281; *Bartonia*, 368; and some others. Besides these, we stepped out of broader zones; first we leave *Tradescantia Virginica* behind, more common in the Pawnee territory than in Virginia or Canada! Further, *Fragaria* and *Fraxinus*, of which some small groves reappeared on Laramie River. In a small stripe of land, on this route, prevails that brilliant blue among the mass of flowers, occasioned by the great masses of *Delphinium azureum* and the different blue *Pentstemons*. We also left the belts of *Œnothera* 16, *Lygodesmia juncea*, *Lygodesmia* 43, *Œnothera albicaulis*, *Cynoglossum Nuttallii*, *Viola Nuttallii*, *Sida coccinea*, *Dodecatheon integrifolium*, *Hippuris*, *Triglochin*, *Lepturus*, *Ceratochloa*, the almost prostrate *Phacæ*, *Purshia*, *Lathyrus ornatus*, *Pentstemon pubescens*, *Draba Caroliniana* (at Horse Creek, in the plains), *Glaux maritima*, and a few others. Once again, a three days' journey through syenitic and pseudo-basaltic confused hills and mountains, we are at last out of this rich group, and have arrived at Rock Independence. At the crossing-place of the northern arm of Platte, the hills are already about 1000 feet high, and showed at that time, (July 15th), snow in the high defiles. They are chiefly clad with *Abies Canadensis* and *Pinus resinosa*, with some traces of the *Juniperus Andina*. These mountains abound in springs, along the margins of which collect *Populus candicans* and *betulæfolia*, with *Cratægus lucida*, and *Negundo*. Here I noticed first the stately *Frasera*, 266, mentioned by Dr. Torrey in Captain Frémont's report, growing between the poplar

groves, on sandstone rocks, later I met with it again on the slopes of the high plateaux at the upper Colorado, it grows on an average, 8 feet high, and has, even in shady situations, a glaucous colour. Here already occurs *Mahonia aquifolia*, so common in Upper Oregon, as also *Arctostaphylos Uva Ursi*, *Espeletia helianthoides*, *Gaillardia pinnatifida*, *Artemisia Lewisii*. Further: *Graminea* 11 and 12, *Juncus* 13, *Heliantheæ* 33 and 34, *Myosotis Virginiana*, *Hyssopus*, 87, *Rubus Nutkanus* (148), *Avena?* 189, *Helianthoidea* 204, *Epilobium latifolium* (*angustifolium?*), *E. coloratum*, *Gymnandra*, 230, *Geum*, 251, *Alismacea?* 271, *Amelanchier Canadensis*, *Eriogonum*, 403, *Streptopus*, 611, *Salix*, 636, *Pulmonaria?* 485, *Senecio*, 484, *Saxifraga granulatus?* and others. Passed through the narrow belts of two or three species of elegant *Calochortus* (68 and 609), *Senecio integerrimus*, *Astragalus succulentus*, *trichocalyx*, *Atheropogon oligostachyon*, *Erigeron glabellum*, *Polygonea*, 162, *Lewisia rediviva*, *Bartonia*, 265, *Phaca*, 3, *Epilobium*, 4, *Oxytropis*, 5, *Œnothera*, 38, *Cantua*, 42, *Marsilea*, 450, *Lupinus*, 29.

It now remains for me to describe the botany of the detached granite mountains, which is very easily done, there being very little vegetation on them. It was not in my power to visit the Wind River and Rocky Mountain Chain; for a description of which, I refer to the account given by Captain Frémont, in his report of 1842, with the notes of Dr. Torrey.

The first point east, on this route, of the detached granite mountains, is Rock Independence, at the Sweet Water River, so named because the first explorers spent here the anniversary day of the independence of their country. The Rock is the great "stranger's book," where every visitor may write his name, and many have done so. The traveller feels a certain joy when he recognizes the names of dear friends, among thousands, who encamped there before him. Here appear a few scattered dwarf *Pinus ponderosa*; *Juniperus Andina*, *Ribes irriguum*, and *R. resinosum*, Pursh, are quite common. Groves of *Populus betulæfolia* make

their appearance at the mountain-slopes, on ironstone and basaltic rocks, with the *Myginda myrtifolia* and *Arctostaphylos* for undergrowth. The other intermediate localities of interest, are already described, or will be mentioned when treating of similar ones, in the sixth or the Green Mountain, or Grassy, Region, of Upper Oregon. Plants, the belts of which we traversed up to the Wind-river Mountains, are *Athanasia* 6; *Astragalus* 21, 50, 52, 120, 125, and others; *Œnothera albicaulis*; *Calochortus*, 68, and two others; *Aplopappus*, 114; *Townsendia ?* 115; *Hordeum jubatum; Plantago eriopoda*; *Eriogonum*, 139; *Hymenopappus*, 141, 142; *Castilleja*, 150, 511; *Delphinium*, 163; *Cleome** *integrifolia*; *Cynoglossum*, 186; *Pentstemon*, 238, 239; *Eriogonum*, 241, 661; *Frémontia vermicularis*, *Vesicariæ* (re-appearing again, as well as *Frémontia*, on the west slope of the Rocky Mountains); *Œnothera*, 647; *Aplopappus*, 7; *Apargia*, 40; *Ranunculus pedatifidus*, Hook.? (110); all the *Potentillæ* except 249 and *P. Norvegica*; *Cymopterus glaucus*, and *glomeratus*,† with many others of less general character.

(*To be Continued.*)

The distinctive characters of some new species of MUSCI, *collected by* PROFESSOR WILLIAM JAMESON, *in the vicinity of* QUITO, *and by* MR. JAMES DRUMMOND *at* SWAN RIVER. *By* THOMAS TAYLOR, M.D.

Quito is situated on the base of Pichincha, a mountain under the equator, whose summit is covered with perpetual snow. On its sides are found representatives of all the genera and species of Mosses of the known world. The far distant and till recently wholly uninvestigated western

* *Cleome integrifolia* is a very common plant as far south-west as the waters of the Colorado, where it at once disappears, and *Cleome aurea*, Hooker, is found in its stead, down to the shores of the Pacific.

† These are two of the many tuberous dwarf *Umbelliferæ*, common in the higher regions here, and especially in Upper Oregon. The Pawnee Indians gather the tubers for food.

shores of Australia, on the banks of Swan River, may easily be supposed to present very novel forms of muscological life. The following species are a few of the discoveries of two well-prepared and practised observers of nature.

PHASCUM, *Hedw.*

1. P. *cylindricum*, caule diviso, ramis simplicibus, foliis oblongis, obtusis, apiculatis, crassiusculis, margine subinvolutis; capsula exserta, erecta, cylindraceo-ovata, in rostellum obtusum, subobliquum desinente.—Swan River, *Mr. James Drummond.*

Tufted, yellowish-green, with numerous shining capsules; stems about 1 line high. Leaves thick. Seta about the length of the capsule. Calyptra dimidiate. This differs from P. *tetragonum*, Hook., by the shorter stems, by the leaves more twisted when dry, which, too, are more obtuse, and are distinctly apiculate, and by the taper (not angular) capsule.

GYMNOSTOMUM, *Hedw.*

1. G. *linearifolium*; caule erecto ramoso; foliis confertis subulato-linearibus, acuminatis, siccitate crispis, perichætialibus laxiusculis; capsula subexserta, inclinata, turbinato-truncata, striata.—Under rocks and on hedge-banks; on Pichincha, 9 Oct. 1827. *Dr. William Jameson*, (Dr. Greville's Herbarium).

Very nearly allied to *Gymnostomum Lapponicum*, Ehrhart, but has the leaves far narrower, more elongated and gradually acuminated (not apiculated), the perichætium more loose, the capsule less exserted and slightly inclined to one side.

2. G. *brevicaule*; caule subcæspitoso, brevi, simplici; foliis late ovatis nervo excurrente apiculatis, margine recurvis, integerrimis; capsula cylindracea, subæquali, operculo conico-rostellato.—Swan River, *Mr. James Drummond.*

Tufts, cursorily observed, appear like those of the European G. *intermedium*, Turn.; but the stems are shorter, the leaves

wider, with margins more remarkably recurved; the setæ are finer; the capsule more cylindrical, and the lid is furnished with an extremely short beak. No annulus is present.

3. G. *inflexum*; caule brevi, subsimplici, laxe cæspitoso; foliis ex lata amplexante basi lanceolatis, nervo apiculatis, integerrimis, margine inflexis, siccitate tortis, incurvis; capsula ovato-cylindracea; operculo oblique rostrato.—Swan River, *Mr. James Drummond.*

Tufts pale yellowish-green. Exterior leaves shorter and wider, all embracing the stem by a thin nearly pellucid base. Capsules pale brown, their mouths, however, as well as their bases are reddish. The seta is very slender and straw-coloured. *Gymn. involutum*, Hooker, is a taller plant, with leaves not so acute and their tips serrulate at the margins, (although not so represented in the "Musci Exotici,") and with capsules more elongate.

4. G. *apophysatum*; caule abbreviato, subsimplici; foliis oblongis, tenuibus, concavis, apiculatis, subserrulatis, nervo ante apicem evanescente; capsula ovata, longius obconice apophysata; operculo plano, calyptra tumida, apice subulata.—Swan River, *Mr. James Drummond.*

Has the habit of a *Funaria*; and the perichætium rose-shaped with tumid congested leaves. Setæ nearly an inch long. From *Gymnostomum Rottleri*, Schwaeg., the present may be distinguished by the more elongated apophysis to the capsule and the evanescent nerve of the leaf.

Leptostomum, *Brown.*

1. L. *squarrosum*; caule laxe cæspitoso, subramoso, ramis erectis; foliis laxis, patenti-recurvis, late ovatis, integerrimis, acutis, margine subflexuosis; capsula obovata, striata, subæquali; operculo tenuiter longirostro.—In marshy situations, at an elevation of 14,000 feet, on Cayambe. *Prof. W. Jameson.* (Dr. Greville's Herbarium).

The stems are more slender than in any of the congeners, while the more distant and squarrose leaves render our plant

conspicuous. The stems are clothed with a brownish down. The mouth of the capsule, when magnified, exhibits a slender annular membrane, connecting sixteen very minute pale teeth.

BRACHYMITRION, *Tayl. nov. gen.*

GEN. CHAR. *Peristomium* simplex. *Dentes* sedecim, equidistantes, lanceolati, erectiusculi, persistentes. *Calyptra* integra, elongato-conica, basi fissa, scabra, capsulam os usque nudam relinquens. *Capsula* subæqualis, erecta, exannulata. *Seta* terminalis, basi bulbosa.

This genus has the stems and leaves of a *Cinclidium* or *Mnium*, the capsule of a *Didymodon*, and the calyptra of a *Grimmia*, but laciniated at the base, as in certain *Encalyptæ*.

1. B. *Jamesoni.*—n. 333. Woods of Pichincha, near Quito, *Prof. W. Jameson*, 1845.

Stems loosely cæspitose, erect, mostly simple, clothed below with a dark purple down. Leaves scarcely imbricated, spathulate-obovate, very obtuse, their nerve excurrent, their margins thickened, denticulate, very pale olive-green. Perichætial leaves similar to the cauline. Seta solitary, erect, thickened at the top, more than ½ an inch long. Capsule erect, cylindrical, pale brownish-green even when ripe; the mouth opaque and dark reddish-brown. Teeth of the peristome firm, lanceolate, acuminate, barred. Lid rostrate, the beak slightly inclined to one side. Calyptra elongato-conical, scarcely longer than the lid, tipped with a style, scabrous on the sides, divided at the base, as in *Encalypta ciliata*, Hedw.

GRIMMIA, *Ehrhart.*

1. G. *leiocarpa*; caule cæspitoso, erecto, subramoso; foliis imbricatis, erecto-patentibus, concavis, ovalibus, acuminato-piliferis, margine planis integerrimis, pilo elongato subdenticulato; setis immersis; capsula emersa, rotundato-ovata, lævissima; operculo conico-rostellato.—Swan River, *Mr. James Drummond.*

Pulvinate, dusky green, hoary. Lower leaves smaller and more patent. Setæ semi-pellucid, shorter than the perichætial leaves, curved. Capsules crisped when dry, but not striated. Peristome of sixteen teeth reclining on the top ot the columella, transversely barred, perforate, frequently bifid. Calyptra entire or campanulate, divided at the base. It is allied to G. *calyptrata*, Hook. (n. 60, *Drummond's Musc. Americ.*), but has the capsules wider, and the margins of the leaves plane, not recurved.

2. G. *cygnicolla*; caule cæspitoso, erecto, ramoso; foliis confertis, subpatentibus, ovato-lanceolatis, pilo integerrimo acuminatis, basi margine reflexis; seta incurvata; capsula ovata, striata; operculo conico-rostellato.—Swan River, *Mr. James Drummond.*

Pulvinate. Stems ½ an inch high, branched at the base. Leaves olive-green, their margins plane above. Setæ, when moistened, so much incurved as partially to conceal the capsules among the leaves. An annulus is present. Teeth of the peristome more red and opaque at their bases, sometimes bifid, and generally perforate. Our plant approaches *Grimmia orbicularis*, Bruch, but has the capsule more round, the beak of the lid shorter, the teeth of the peristome more laciniated or perforated, the colour duskier, the leaves narrower and recurved throughout the entire margin.

Orthotrichum, *Hoffman.*

1. O. *elongatum*; caule laxe cæspitoso, elongato, adscendente, ramoso, apice incrassato; foliis imbricatis, recurvato-patentibus, lanceolatis, acuminatis, margine reflexis, substriatis, integerrimis; capsula breviter pedicellata, elongate ovali, lævi, calyptra pilosa.—On trees, near Quito, *Prof. William Jameson*, 1845.

Monœcious. Stems two inches long, annually proliferous from their summits, which are subcapitate from their longer and more crowded leaves. Pedicels, often two from the same point of the stem, a little longer than the capsules.

Outer peristome of eight double teeth, reflexed when dry, inner of eight double ciliæ, a pair opposite to the corresponding pair of teeth, sometimes with one or two scariose cells along one side, projecting beyond the lanceolate outline. This greatly resembles O. *leiocarpum*, Br. et Schimp. but is much larger, has a more hairy calyptra, the setæ are longer and the ciliæ are not so remarkably fimbriato-erose.

SCHLOTHEIMIA, *Schwaeg.*

1. S. *oblonga*; caule laxe cæspitoso, erectiusculo, elongato, subflexuoso, basi subsimplici, supra ramoso; foliis imbricatis, elongatis, recurvatis, lanceolato-subulatis, apice subserrulatis, canaliculatis, margine recurvis; capsula oblonga, sulcata, operculo recto, rostrato; calyptra sulcata, laciniato-fissa, lævi.—n. 322. Andes of Quito, *Prof. William Jameson*, 1845.

Stems sometimes 3 inches long, with a few fastigiate branches above. The younger parts are of a yellowish-green and shining, the older brownish-rust-coloured. Pedicels at length lateral, yet over-topping the shoots. The margins near the tops of the leaves are much crisped, and serrulate; outer peristome very short, almost annular; inner, a whitish short membrane very irregularly divided. The double peristome, longer capsule, and subserrulate leaves, distinguish this from *Orth. longifolium*, Hooker.

ZYGODON, *Hook. et Tayl.*

1. Z. *Drummondii*; caule abbreviato, erecto, cæspitoso, subsimplici; foliis oblongo-obovatis, acuminulatis, canaliculatis, nervo ante apicem evanescente; capsula obovata, apophysata, sulcata; operculo conico-rostellato.—On bark, Swan River, *Mr. James Drummond.*

Stems scarcely 2 lines high. Leaves dusky olive-green, rather obtuse, but with a short point, formed, not by the nerve, but by the pagina of the leaf. Setæ flexuose when dry. Lid conical, with a very short beak. Calyptra dimidiate,

dark-brown above. Teeth of the peristome approached in pairs. The ciliæ have escaped observation in the present specimens. This species differs from Z. *conoideus,* H. et T., by the shorter stems, the wider leaves, the thicker and shorter setæ, and remarkably by the short beak to the lid of the capsule ; besides, the upper half of the calyptra is blackish-brown, while in the European plant it is whitish.

CAMPYLOPUS, *Bridel.*

1. C. *lævis* ; caule cæspitoso, stricto, subfasciculatim ramoso, ramis erectis ; foliis imbricatis, erectis, lineari-lanceolatis, late nervosis, concavis, piliferis ; capsula elongate ovata, lævi, ore angustato ; seta flexuosa ; calyptra basi piloso-hirsuta.—n. 329. On Pichincha, near Quito, 9. Oct. 1827. *Prof. William Jameson.* (Dr. Greville's Herbarium),

Stems nearly 1 inch high; the older parts brown, the newer pale-green or straw-coloured; young shoots erect, rigid. Capsule unequal, destitute of striæ, the mouth narrow, the base with a minute blackish apophysis. Teeth of the peristome pale, bipartite. Seta short, the lower half covered by the adpressed perichætial leaves. The lid elongato-conical. Calyptra split on one side, it is circumscissed, and sends down in continuation numerous parallel hairs, as well as sends up, lying on the calyptra, a few erect ones. The C. *pyriformis,* Brid. is said to have, as in this species, the capsule destitute of furrows, but, its obovate shape, and the leaves of that plant being furnished with narrow distinct nerves, are decisive differences.

TRICHOSTOMUM, *Hedw.*

1. T. *crispipilum* ; caule cæspitoso, erecto, fasciculatim ramoso, ramis brevibus, erectis ; foliis imbricatis erectiusculis, ovato-lanceolatis, margine reflexis, in acumine piliformi crispo productis ; capsula lineari-cylindracea, erecta, subæquali ; foliis perichætialibus convolutis, strictis, obtusis, apiculatis.—Summit of the Quitinian Andes, *Prof. William Jameson,* 1845.

Two inches high, pale olive. Leaves with a diaphanous, subserrulate, crisped or closely-waved point. Peristome of sixteen filiform, short teeth, split to their bases. Calyptra mitræform. Perichætia axillary, hence the capsule scarcely overtops the shoots. It is nearly allied to the european T. *fasciculare*, Schrad., but the elongated linear capsules and waved hair-points to the leaves, as well as the perichætia, are very distinctive.

Didymodon, *Hedw.*

1. D. *luteus*; caule laxe cæspitoso, elongato, subramoso, ramis erectis; foliis laxe imbricatis, squarroso-recurvis, canaliculatis, oblongo-lanceolatis, serrulatis, margine reflexis atque flexuosis, subundulatis; capsula inæquali, cylindracea, erecta; operculo breviter rostrato.—Common on Pichincha, near Quito, *Prof. William Jameson.* (Dr. Greville's Herbarium.)

Tufts loose, palet awney above, brownish below, 3 to 4 inches high. Texture of the leaves dense; their nerve diaphanous by transmitted light. Peristome of sixteen linear teeth, split to their bases. Setæ terminal, scarcely 1 inch long. The leaves and stems are like those of *Bryum? recurvifolium,* lately found in Ireland, whose fructification, hitherto undiscovered, may prove to be analogous.

Barbula, *Hedw.*

1. B. *Jamesoni*; caule laxe cæspitoso, erecto, subramoso, amis elongatis; foliis laxis, patenti-recurvis, siccitate tortis atque incurvis, ex lata amplexante basi lineari-lanceolatis, obtusiusculis, margine infero reflexis, supero serrulatis, nervo valido percurrente; capsula subæquali, cylindracea, erecta.—On Pichincha, near Quito, October, 1827, *Prof. William Jameson,* (Dr. Greville's Herbarium).

Stems from 2 to 3 inches high, slightly flexuose, pale olive, branches few. Leaves rather distant, when dry twisted and

incurved and their margins inflexed; their structure dense, with minute cells. Setæ about 1 inch long, terminal. Capsule slightly curved to one side. Peristome short, pale, twisted. The Irish *Barbula cylindrica* (*Zygotrichia,* Flor. Hib.), is its nearest ally, in which, however, the leaves are more crowded, quite entire and acuminated.

2. B. *inæqualifolia*; caule brevi, gracili, simplici; foliis erecto-patentibus, subimbricatis, margine reflexis, inferioribus minoribus ovatis superioribus lanceolatis, omnibus obtusis, integerrimis, nervo valido percurrente; perichætialibus majoribus, erectis, elongatis; capsula erecta, ovato-cylindracea, leviter curvula.—On Pichincha, near Quito, *Prof. William Jameson,* (Dr. Greville's Herbarium.)

Stems 1-2 lines high, very slender. Lower leaves very small, the perichætial the largest, forming a conspicuous cylindrical sheath to the base of the seta. Capsule large compared with the slender stems, slightly curved on one side. Peristome of filiform, pale-red, twisted teeth, divided to their bases. In *Barbula revoluta,* Mohr, the stems are longer, and are branched, the leaves more crowded and acute, and the capsule far shorter.

3. B. *replicata;* caule simplici, erecto, subcæspitoso! foliis laxe imbricatis erecto-patentibus, subrecurvis, lanceolato-ovatis, integerrimis, obtusis, nervo excurrente apiculatis, margine toto reflexis; capsula elongate ovata, erecta; operculo subulato.—On walls, near Quito, *Prof. William Jameson,* (Dr. Greville's Herbarium).

Tufts loose, pale green. Stems nearly half an inch high. Leaves with their margins reflexed from the base to the apiculus. Allied to the preceding; the shoots are longer and thicker, their colour a paler green, the leaves with a decided apiculus and the cylindrical perichætia are wanting.

4. B. *rectifolia;* caule laxe cæspitoso, erecto, surculis binis annotinis ramoso; foliis erectiusculis, imbricatis, ovato-lanceolatis, acuminatis, integerrimis, margine infero reflexis, supero planiusculis, nervo percurrente, perichætialibus majoribus, longius acuminatis; capsula elongate ovata,

æquali, erecta.—Accompanied by *Didymodon purpureus*, H. et T. on, Pichincha, at an altitude of 12,000 feet; 9th of October, 1827, *Prof. William Jameson*, (Dr. Greville's Herbarium).

Tufts very pale green, about half an inch high. Stems slender, suddenly expanding into a terminal perichætium, from beneath which a pair of more slender annotinous shoots arise. Leaves straight, rigid, and acuminated. Setæ slender, Peristome of sixteen pale, twisted, filiform teeth, divided down to their bases. The leaves are never patenti-recurved as in B. *fallax*, Hedw., which, too, is destitute of any notable perichætium.

5. B. *erythrodonta*; caule laxė cæspitoso, erecto, ramoso; foliis imbricatis, erecto-patentibus, subrecurvis, concavis, elongatis, oblongo-ovatis, acuminatis, longius apiculatis, margine infero recurvis, supero serrulatis, nervo percurrente; capsula cylindraceo-oblonga, erecta, æquali, seta abbreviata.—On Pichincha, near Quito, *Prof. William Jameson*, (Dr. Greville's Herbarium).

Stems about 1 inch long, pale yellowish-olive. Branches fertile. Leaves somewhat fascicled, terminated by a long setaceous apiculus, consisting almost entirely of the produced nerve. Setæ short, scarcely overtopping the shoots, straw-coloured, twisted when dry. Perichætial leaves similar to the cauline. Peristome blood-red, of short filiform twisted teeth. This species has shorter setæ than any described *Barbula*. Its large leaves and wide capsules, likewise give it a peculiar aspect.

6. B. *torquata*; caule cæspitoso, brevi, erecto, subramoso; foliis confertis, erecto-patentibus, lanceolatis, acuminatis, integerrimis, margine reflexis, nervo percurrente, siccitate spiraliter atque arcte convolutis; capsula erecta, subæquali, oblongo-ovata, operculo elongate conico.—Swan River, *Mr. James Drummond.*

Stems about 3 lines high, yellowish-green above, brownish-yellow below. Leaves straight, the perichætial similar to the cauline. Setæ pale red, slender, subflexuose. Lid an

elongated cone. Peristome of filiform twisted teeth. In the dry state the twisted leaves give to the shoots the habit of *Racopilum tomentosum*, Swartz.

7. B. *crassinervia*; caule aggregato, simplici, humili; foliis in rosulam congestis, obovatis, obtusiusculis, apiculatis, margine recurvis, nervo incrassato, siccitate contortis atque incurvis; capsula erecta, æquali, elongate ovata; operculo-conico rostellato. — Swan River, *Mr. James Drummond.*

Stems minute. Leaves pale green, the nerve thickened above. Setæ slender, pale red. Peristome short, twisted. From *Barbula rigida*, Hedw., the present species is at once distinguished by the nerve incrassated above, and by the reflexed margins of the leaves.

8. B. *rufiseta*; caule cæspitoso, brevi, subsimplici, erecto; foliis linearibus acuminatis integerrimis, margine reflexis, siccitate intortis; capsula cylindraceo-ovata, erecta; operculo subulato.—Swan River, *Mr. James Drummond.*

Stems 1 or 2 lines long, crowded. Leaves linear, acute, pale olive-green, when moistened opening in a stellate manner, twisted and variously incurved when dry. Capsule narrow; peristome of sixteen filiform, bipartite, twisted teeth. Setæ about ½ inch long, red, flexuose. The very narrow linear leaves, twisted when dry, separate this species from its described congeners.

Bryum, *Linn.*

1. B. *soboliferum*; caule fertili (seu perichætio) brevissimo, foliis congestis; sterili elongato filiformi erecto, foliis distantibus, omnibus lanceolatis, margine planis, subserrulatis; capsula elongate pyriformi nutante, operculo conico; ciliis solitariis inter peristomii interni lacinia interjectis.—n. 328. On Pichincha, near Quito, *Prof. William Jameson*, 1842.

Diœcious. Tufts loose, brownish-green. From the base of the fertile shoot (or perichætium) rootlets are sent down;

from nearly the same point arise sterile very slender shoots which bear young perichætia with their rootlets; on different sterile shoots perigonia occur. Leaves erecto-patent. Sterile shoots nearly 2 inches long.

2. B. *pungens*; caule laxe cæspitoso, erecto, surculis subfastigiatis, apice incrassatis; foliis arcte imbricatis, erectis, cordato-triangularibus longius atque tenuiter acuminatis integerrimis, nervo percurrente; capsula elongate pyriformi, subhorizontali.—On dry banks, on Pichincha, near Quito, *Prof. William Jameson*, (Dr. Greville's Herbarium).

Stems scarcely ½ an inch high; shoots several from near the base of the perichætium, pale-olive, slender below, incrassated above. Leaves crowded, their setaceous points only standing out from the stem, sometimes striated, their margins plane. Perichætium very short. Setæ nearly 2 inches long, thickened above and bent nearly at right angles. Capsule large compared with the stems, sometimes as long as an entire shoot, the apophysis elongated and longitudinally wrinkled. A single filiform process interposed between each pair of laciniæ of the inner peristome. The closely imbricated, shining, yellowish-green leaves with setaceous points, and the slender stems compared with the large fruit, keep this species distinct from its congeners.

3. B. *tenuissimum*; caule laxe cæspitoso, erecto, tenuissimo, subramoso; ramis filiformibus, simplicibus, micantibus; foliis arcte imbricatis, erectis, oblongis, obtusissimis, ruptinerviis, concavis, integerrimis, margine subrecurvis, perichætialibus nervo excurrente longius apiculatis.—Swan River, *Mr. James Drummond.*

Scarcely ½ an inch high, pale yellowish-green, shining; leaves tumid, closely adpressed to the stems. Perichætium axillary, ovato-lanceolate. This has the habit of *Bryum julaceum*, Schrader. It is slenderer, and more yellow, and has more obtuse leaves. The fruit is unknown,

4. B. *campylothecium*; caule cæspitoso, erecto, ramoso, basi tomentoso, apice incrassato; foliis in rosulam aggregatis,

erecto-patentibus, siccitate adpressis atque paululum tortis, oblongo-ovatis, acutiusculis, marginatis, apice serrulatis, nervo in mucronem elongatum excurrente; capsula ex apophysi angustiore ovato-cylindracea, incurva; operculo conico mamillato.—Swan River, *Mr. James Drummond.*

One inch high, pale yellowish-green, shining. Leaves clustered at the tops of the stems; when dry, their crowded excurrent nerves resemble a brush. Setæ 1 inch high, slender, red, incurved above. Capsule cernuous, unequal or slightly incurved to the fruit-stalk. A double annulus is present. Calyptra dimidiate. Differs from B. *Billardieri*, Schwaeg., by the greater size, the leaves more congested above, the more excurrent nerve, and by the capsule suddenly swelling out at its base above the narrow apophysis.

5. B. *inæquale*; caule subcæspitoso, gracili, brevissimo, erecto, subramoso; foliis imbricatis, erectis, adpressis, ovatis, acuminatis, subserrulatis, basi margine reflexis, nervo percurrente; capsula cylindraceo-pyriformi, subcernua; operculo conico, mamillato.—Swan River, *Mr. James Drummond.*

Two to three lines high, grouped, pale olive-green. Leaves, even, when moistened adpressed into a capitulum. Seta exceeding 1 inch in height, reddish, flexuose, curved at the top. Capsule, from a narrow obconical apophysis, obovate. A double annulus is present. Lid obtusely conical. As in *Bryum Funckii,* Schwaeg., the fruit bears a great ratio to the diminutive stems; the present differs from that species by the more acuminate leaves, which are more crowded, and whose nerve is not excurrent into an apiculus.

6. B. *multicaule*; caulibus cæspitosis, nitidis, pallide virescentibus, elongatis, basi ramosis, sursum incrassatis; foliis imbricatis, erectis, apice patentibus, cordatis, acuminatis, serrulatis, basi margine recurvis, nervo percurrente; capsula cylindraceo-pyriformi, subnutante; operculo conico. —Swan River, *Mr. James Drummond.*

Shoots simple, thickened above by the more crowded leaves. Perichætium very short, its leaves upright, crowded,

rigid, from its base arise two or more annotinous shoots, so that the fruit appears radicular. The capsule has the habit of that of *Pohlia elongata*, Hedw., but our specimens are too immature to determine the peristome. Seta 1 inch long, subflexuose. The shining pale green tufts, with crowded slender shoots resembling those of a *Hypnum*, render this species remarkable among its congeners.

7. B. *creberrimum*; caule cæspitoso, erecto, ramoso; foliis perichætialibus in rosulam coarctatam congestis, ovatis, surculorum elongatorum lanceolatis, acuminatis, margine subreflexis, flexuosis, subintegerrimis, laxioribus; seta elongata; capsula nutante ex angusta rugosa apophysi cylindracea; operculo convexo, mamillato.—Swan River, *Mr. James Drummond.*

Stems aggregate, reddish. Leaves pale olive; on the fertile stem few, and collected into a close short upright shoot, from the base of which several simple branches arise, on which the leaves are more distant, and somewhat folded: the nerve in all is excurrent into a considerable point. Setæ very long, flexuose, numerous. This differs from *Bryum obconicum*, Br. et Schimp. (a specimen of which, collected by Mr. R. Spruce near Barnard Castle, has been compared,) by the more elongated sterile shoots, their narrower leaves, and by the more elongated capsules, which are by no means obconical, but from a shrunken narrow apophysis are cylindrical.

Bartramia, *Hedw.*

1. B. *strictifolia*; caule laxe cæspitoso, erecto, subsimplici; foliis imbricatis, strictis, subulato-setaceis, subserrulatis, margine reflexis, inferioribus adpressis, rectis, superioribus recurvis; capsula erectiuscula ex angusta basi subglobosa, striata; opercula convexo, obtuse mamillato.—Swan River, *Mr. James Drummond.*

Stems an inch high, at the base clothed with a dark-brown down, in the middle reddish-brown, at the tops glaucescent

green. Setæ slender, flexuose, about 1 inch long. The young capsule turbinate, inclined to one side. Inner peristome much shorter than the outer. In *Bart. ithyphylla*, Brid., the base of the leaves is more amplexicaul, and the stems shorter.

2. B. *integrifolia*; caule cæspitoso, elongato, erecto, vage ramoso, ramis subfasciculatis; foliis imbricatis, erecto-patentibus, ovato-lanceolatis, longius acuminatis, integerrimis, margine reflexis; capsula pyriformi-oblonga, striata, cernua; operculo umbonato.—On the Quitinian Andes; *Prof. William Jameson*, 1845.

Stems 2-3 inches high, pale yellowish-green. Leaves usually with a single twist at their tips, concave beneath, entire above. Inner peristome of sixteen laciniæ, each covered by a tooth of the outer peristome, each, also, is bipartite, containing a shorter double, filiform process between the division. Approaches *Bartr. tomentosa*, Hook. but the plant is shorter, the leaves are entire, and the capsule oblong, and with a considerable apophysis, which renders the whole pyriform.

3. B. *angulata*; caule cæspitoso, erecto, fastigiatim-ramoso, ramis gracillimis, subtetragonis; foliis imbricatis, erectis, cordato-lanceolatis, acuminatis, denticulatis, margine reflexis; capsula late ovato-oblonga, decurva, striata; operculo conico; seta elongata.—Near Quito, *Prof. William Jameson*, 1845.

Nearly two inches high, pale green; branches very slender. Leaves in four rows, closely adpressed to the stem. Perigonial leaves larger than the cauline. Seta 1½ inch long. Inner peristome a short membrane with sixteen laciniæ, which are variously truncate and foraminulose. Differs from *Bart. uncinata*, Schwaeg., by the taller size, more slender habit, the leaves scarcely secund, their bases wider, and by the more oblong capsule which is arched downwards.

Brachymenium, *Schwaeg.*

1. B. *subrotundum*; caule cæspitoso, erecto, subramoso; foliis laxe imbricatis, erecto-patentibus, siccitate tortis, ovato-oblongis, longius apiculatis, apice serrulatis, marginatis, nervo percurrente; seta elongata, apice decurva; capsula ex angusta basi subrotunda.—On Pichincha, near Quito; Feb. 1826, *Prof. William Jameson*, (Dr. Greville's Herbarium.)

Tufts scarcely 2 lines high, shining, yellowish-green. Leaves, even when moistened, somewhat twisted, contracting suddenly into a long serrulate point. Seta curved down before reaching the capsule, which, therefore, does not depart from the natural character of the genus, for it is truly erect, or rather in the same direction as the superior portion of the seta. Peristome very short, the interior of sixteen bifid, variously truncated ciliæ, which sometimes have a short filiform process at the base of the division. The subrotund capsule, cernuous from the bending of the seta, distinguishes this from its congeners.

Glyphocarpa, *Brown.*

1. G. *lævisphera*; caule laxe cæspitoso, erecto, subramoso; foliis imbricatis, patenti-recurvis, secundis, lanceolato-subulatis, longius acuminatis, serrulatis, margine reflexis, nervo percurrente; seta subexserta; capsula erecta, sphærica, lævi.—On Pichincha; growing on shaded trunks of trees, and on the ground; September, 23, 1826. *Prof. W. Jameson*, (Dr. Greville's Herbarium.)

Tufts loose, ½ inch high, brownish-olive. Leaves very rigid, but little altered in position when moistened, their points setaceous and very long. Fruit out-topped by the stems, supported on very short pedicels. Capsules quite round and smooth. Peristome a very short annular membrane. The thick shoots and short setæ separate this from its congeners.

Funaria, *Schreber.*

1. F. *subnuda*; caule aggregato, erecto, simplici, basi subnudo; foliis congestis, erectis, concavis, late ovatis, acutis, subintegerrimis, nervo vix pertingente; capsula erectiuscula, lævi, ovata, elongate apophysata; operculo plano.—Swan River, *Mr. J. Drummond.*

Stems crowded, scarcely ½ an inch high, pale yellowish-green, naked below. Shoots rose-shaped. Leaves very concave, subserrulate at their tops. Seta about twice the length of the capsule: this is smooth, ovate, placed on an obconical apophysis. There is no annulus present. Outer peristome with sixteen lanceolate, oblique teeth; inner very short, the laciniæ obtuse, very irregular. Lid quite flat. Base of the calyptra inflated, its beak inclined. This differs from *Funaria Templetoni*, Smith, by the fewer, more concave, and wider leaves; by the smaller size, and by the nearly erect capsule, with a narrower mouth.

2. F. *glabra*; caule erecto, simplici, basi nudo; foliis in rosulam congestis, erectis, oblongo-obovatis, apiculatis, serrulatis, nervo evanescente; capsula glabra ovata, hinc gibba illinc declinata, elongate apophysata; operculo plano acuminulato.—Swan River, *Mr. James Drummond.*

Stems loosely aggregate, dusky-olive, naked below. Leaves patent when moistened, from a narrow base obovate and suddenly apiculate, subserrulate. Seta one inch high, smooth, slightly twisted when dry. There is no annulus present. Outer peristome with sixteen oblique teeth; inner very short, of sixteen very irregular laciniæ. Calyptra campanulato-subulate. To judge by the plate and description of F. *Fontanesii*, given by Schwaegrichen, the present differs by the wider leaves, with longer points, and essentially by the shortness of the inner peristome.

Schistidium, *Bridel.*

1. S. *Drummondii*; caule laxe cæspitoso, erecto, ramoso; foliis imbricatis, patentibus, siccitate erectis adpressis, late

ovatis, perichætialibus oblongo-lanceolatis erectis, omnibus apiculatis, concavis, margine recurvis, integerrimis, nervo latissimo percursis; capsula subexserta, rotundato-ovata, siccitate rugoso-striata; operculo rostellato.—*S. australe, Wils. Mss. et Herb. Hook.* n. 3658 *(fide G. J. Lyon)*.—Swan River, *Mr. James Drummond.*

Tufts scarcely 2 inches high, tawny-olive. Stems, when dry, taper; often emitting far more slender, flagelliform shoots, whose leaves are very thin, and have a short wide amplexicaul base and elongated subulato-setaceous recurved point, by which character this species is readily recognised. The leaves are entire, but are rough with points on the margins from cellules that project there as on their backs. Perichætium conspicuous from its larger, more erect, and more oblong leaves. Seta as long as the capsule, sometimes curved and holding the capsule out beyond the side of the perichætium.

Fabronia, *Raddi.*

1. F. *incana*, caule cæspitoso, procumbente, ramoso; ramis brevibus, confertis, erectis; foliis imbricatis, erecto-patentibus, lanceolatis, acuminatis, elongate ciliatis, enervibus; capsula turbinata, erectiuscula; operculo planiusculo scarioso.—Swan River, *Mr. James Drummond.*

Tufts wide, dense, pale greenish-white, hoary; roots purplish; stems about ½ an inch high. Leaves closely imbricated, crowded, linear-lanceolate, ciliæ simple without articulations; perichætial leaves closely convoluted about the base of the pedicell. Seta about 3 lines long. Capsule with a minute opaque apophysis at its base. Commissure of the lid with the capsule, as well as its centre, opaque, the rest pellucid and scariose. Teeth of the peristome eight, each marked with three longitudinal lines, incurved.

Pterogonium, *Swartz.*

1. P. *Jamesoni*; caule laxe cæspitoso, procumbente, pinnato; ramis compressis, attenuatis, patentibus; foliis imbricatis, erecto-patentibus, elliptico-lanceolatis, concavis, enerviis, subdenticulatis; capsula lineari-cylindracea; operculo conico.—On Pichincha, near Quito, *Prof. William Jameson*, 1845.

Perichætium subulate, its leaves closely adpressed. Seta very slender, pale green, at length pale brownish, arising from the main stem. Calyptra dimidiate. Capsule elongate, elliptico-cylindrical. Peristome of sixteen very short, subtruncate teeth, incurved and marked with a line in the axis. This has the complanate habit, and compressed and attenuated branches so common among the *Neckeræ*, but very unusual among the *Pterogonia.*

Neckera, *Hedw.*

1. N. *Jamesoni;* caule laxe cæspitoso, procumbente, subbipinnato; surculis complanatis, foliis laxe imbricatis, erecto-patentibus, oblongo-lanceolatis, undulatis, integerrimis, enerviis, basi margine incurvo; capsula late ovata; seta exserta.—On the Quitinian Andes, *Prof. William Jameson*, 1845.

Perichætium closely investing the base of the pedicell, the exserted part of which is about the length of the capsule. Exterior peristome of sixteen lanceolate, acuminate, trabeculate teeth, interior of very slender filiform articulate laciniæ connected at their bases by a short membrane. This approaches very near to N. *Douglasii*, Hook. It differs by its greener colour, its entire leaves, which are more gradually acuminated, and by the top of the perichætium not reaching to the base of the capsule.

2. N. *luteo-virens*; caule laxe cæspitoso, erecto, subbipinnato; surculis compressis, erecto-patentibus; foliis imbricatis, erectiusculis, siccitate, crispis, ovatis, longius acumi-

natis, dentatis, margine recurvis, striatis; capsula emersa, late ovata, perichætio arcte imbricato. — On Pichincha, near Quito, *Prof. William Jameson*, 1845.

The perichætia are mostly concealed among the leaves. Teeth of the peristome very long, whitish, crisped when dry, the exterior linear-lanceolate, transversely barred, the interior consists of slender elongated laciniæ united at their bases by a very shallow membrane. This species exceeds 10 inches in length, and is of a pale yellowish-olive colour.

Hookeria, *Smith.*

1. H. *Grevilleana;* caule laxe cæspitoso, basi ramoso, surculis adscendentibus, simplicibus, complanatis; foliis subimbricatis, patentibus, planiusculis, undulatis, oblongo-lanceolatis, serrulatis, basi binerviis; seta elongata, subflexuosa, scaberrima; capsula ovata, inclinata; operculo conico-rostrato; calyptra sursum pilosa.—On trunks of trees, in the Forest of Esmeraldos, at an altitude of 3,000 feet, 29 Nov. 1829, *Prof. William Jameson,* (Dr. Greville's Herbarium.)

Shoots shining, pale yellowish-green, scarcely 2 inches high, more than $\frac{1}{6}$ of an inch wide. The undulated leaves and pilose calyptra are anomalies in the genus. The outer peristome is of sixteen strongly barred teeth, each with a longitudinal dark line, the inner consists of sixteen laciniæ united at their bases. Calyptra entire. This is one of the most beautiful species of the genus, now dedicated to Dr. Robert Kaye Greville in grateful testimony of the liberality with which he has sent me his valuable cryptogamic collections for examination.

2. H. *erectiuscula;* caule laxe cæspitoso, erectiusculo, subramoso, foliis laxis, patentibus, tenuibus, oblongo-ovatis, apiculatis, serratis, basi binerviis, seta scabra; capsula erecta, elongate obconica.—On branches of trees, in the Forest of Esmeraldos, at an altitude of 6,000 feet, *Prof. William Jameson,* 1827, (Dr. Greville's Herbarium.)

Stems exceeding 2 inches in height; shoots complanate, pale olive-green. Leaves substriated, flexuose. Exterior peristome of sixteen short opaque teeth, inner of as many longer ciliæ united at their bases by a shallow membrane. Seta about 1 inch long. In a dry state the leaves are twisted and shining. Shoots nearly ¼ of an inch wide.

3. H. *chloroneura;* caule laxe cæspitoso, debili, procumbente, subramoso; foliis laxis, tenuibus, patentibus, oblongis, acutis, serratis, binerviis; seta scabra, brevissima, flexuosa; capsula inclinata, turbinata; operculo recto, rostrato.—On Pichincha, near Quito, *Prof. William Jameson.*

Only a single specimen occurred; but the diminutive fruit, compared with the elongated stems, renders our species very distinct. While the leaves, especially in the inferior parts, are almost colourless and scariose, their deep green pair of nerves likewise furnishes a diagnostic character. The calyptra is entire, laciniated at the base and descends as far as the mouth of the capsule.

LESKEA, *Hedw.*

1. L. *superba;* caule dendroideo, erecto, basi simplici, sursum fasciculatim ramoso; ramis subpinnatis, complanatis, attenuatis; foliis laxe imbricatis, subpatentibus, concavis, late ovatis, subacutis, denticulatis, mediotenus uninerviis, substriatis; capsula ovata, erecta; operculo longius rostrato; seta elongata.—No. 330, on trunks of trees, on Pichincha, near Quito, *Prof. William Jameson,* 1845; also, sent collected in 1827 to Dr. R. K. Greville, from the ridge of Pisagua, at an altitude of 10,000 feet, by *Prof. Jameson.*

Perichætium from the inferior side of a branch, pale brown; while the leaves are grass-green in fresh specimens. Peristome of elongated linear-lanceolate teeth, those of the outer trabeculate, of the inner foraminulose, and united at the base by a short membrane, and having exceedingly short

ternate or binate processes interposed. An annulus is present. Differs from *Neckera planifolia*, Hook., by the greater size, being 8 inches high, by the more branched stem, by the nerved leaves and by the seta arising from the branches, not, as in the *Neckera*, from the principal stem.

2. L. *gymnopoda*; caule procumbente, ramoso, ramis dendroideis, adscendentibus, basi nudis, sursum fasciculatis; surculis complanatis, attenuatis; foliis laxe imbricatis, erecto-patentibus, siccitate striatis, ovato-lanceolatis, margine basi recurvis sursum serrulatis mediotenus uninerviis; perichætialibus majoribus, recurvis; capsula inclinata, anguste apophysata, ovata.—Woods on the western declivity of Pichincha, *Prof. William Jameson*, (Dr. Greville's Herbarium.)

The naked and simple part of the shoots is very slender; branches rather short. Perichætia two or three together, of conspicuous size. Outer peristome of sixteen barred, lanceolate teeth, inner of as many foraminulose ciliæ united at the base by a short membrane. Allied to the preceding, but comparatively diminutive, with narrower and more acute leaves and an apophysated capsule.

3. L. *angustata*; caule laxe cæspitoso, procumbente, vage ramoso; surculis teretibus; foliis imbricatis, erectis, cordatis, acuminatis, margine basi recurvis, integerrimis, nervo ante apicem evanescente; capsula cylindracea, erectiuscula.—On trunks of trees, about Quito, common. *Prof. William Jameson*, 1827, (Dr. Greville's Herbarium.)

Stems about 1 inch long, pale olive-green; shoots taper with closely adpressed leaves. Perichætia lanceolate, erect, a little longer than the capsules. Leaves minutely dotted. Inner peristome of sixteen very short laciniæ which are irregular in breadth, united at their bases. Differs from *L. rostrata*, Hedw. by the more taper shoots, the more closely adpressed leaves, whose margins are plane above and remarkable by the cylindrical capsules.

4. L. *imponderosa*; caule pendulo, gracillimo, flexuoso,

elongato, subpinnato; ramis patentibus, subdistantibus, subcomplanatis, acuminatis; foliis laxis, erecto-patentibus, lanceolato-acuminatis, mediotenus uninerviis, basi margine recurvis, serrulatis, siccitate striatis.—Forest of Esmeraldos, *Prof. William Jameson*, (Dr. Greville's Herbarium.)

Stems a foot or more long, very slender; branches short, nearly at right angles with the stem. Leaves with a very slender nerve. This has all the habit of *Leskea mollis*, Hedw. the leaves, however, are less closely imbricated, are serrated, with longer and narrower points and a short nerve.

Hypnum, *Linn.*

1. H. *Jamesoni*; caule tripinnato, procumbente; ramis tenuibus; foliis remotiusculis, patentibus, caulinis cordatis longius acuminatis, subintegerrimis, rameis ovatis acutis denticulatis, omnibus enerviis, substriatis; capsula late ovata, pendula; operculo conico-rostellato; seta lævi, apice deflexa, in apophysin abeunte.—No. 332, in woods on the western side of Pichincha, *Prof. William Jameson*, 1845.

It has the habit of the European H. *prolongum*, L.; the branches, however, are more slender, the leaves nerveless, the elongated setæ smooth and the capsule pendulous. Outer peristome of sixteen trabeculate elongato-acuminate teeth; the inner of as many perforated laciniæ, with two or three lesser filiform processes interposed.

2. H. *Drummondii*; caule cæspitoso, adscendente, ramoso; ramis confertis, apice subincurvis; foliis imbricatis, erectiusculis, secundis, oblongo-ovatis, apiculatis, concavis, enerviis, margine reflexis, integerrimis; seta surculo subæquali, lævi, sursum incrassata; capsula erectiuscula, inæquali, anguste ovata; operculo longius curvirostro.—Swan River, *Mr. James Drummond.* In the London Journal of Botany, Mr. Wilson states it to have been found likewise by *Dr. Joseph D. Hooker* at Van Diemen's Land, and by Mr. Cunningham at King George's Sound.

Tufts wide, dense, golden-yellow, the very young shoots

pale green. Shoots about 1 inch high, the older reddish. Perichætia small, about the middle of the shoots, sending down rootlets. Capsules erect at the base, slightly curved above. Inner peristome of sixteen laciniæ with single filiform processes interposed. It has much the habit of H. *tenuirostre*, Hook., but the shoots are shorter, the leaves are entire and have reflexed margins, and shorter points, while the capsule is more erect.

2. H. *lepturum*, caule cæspitoso, procumbente, ramoso; ramis brevibus subincurvis, lucidis, pallidissime virentibus; foliis arcte imbricatis, erectis, secundis, lanceolatis, acuminatis, subserrulatis, basi marginibus recurvis, mediotenus uninerviis.—Swan River, *Mr. James Drummond.*

Tufts forming flattish shining silvery green cushions a foot or more wide. Leaves near the tops of the shoots with elongated, almost piliferous summits. The very slender and taper branches remind one of H. *reflexum*, Web. et Mohr.; our plant, however, has a distinguishing whitish-green silky lustre, and the leaves have their nerves reaching only half way to the summits.

4. H. *expansum*; caule repente; surculis adscendentibus, implexis, subpinnatis; ramis utrinque acuminatis, complanatis; foliis laxe imbricatis, subpatentibus, distichis, oblongis, apice rotundatis, apiculatis, serratis margine planis, mediotenus uninerviis, seta lævi, apice decurva; capsula ovata.—On Pichincha, near Quito, *Prof. William Jameson*, 1827, (Dr. Greville's Herbarium.)

Shoots pale green, nearly 3 inches high, bent at their tops. Leaves with the margins at one side of the base inflexed. Outer peristome of sixteen lanceolate, barred teeth, inner of as many foraminulose laciniæ with two filiform processes interposed between each pair. Our plant is scarcely dendroid—as are H. *alopecurum*, L., and H. *neckeroides*, Hook., both of which, besides, have very concave leaves, with margins reflexed and with a solid nerve reaching nearly to their summits.

5. H. *microcladum*; caule subimplexo, procumbente; ramis abbreviatis, erectis, subcomplanatis; foliis laxe imbricatis,

patentibus, ovalibus, apiculatis, enerviis, integerrimis, basi margine recurvis; perichætialibus strictis, erectis, longius acuminatis, adpressis, substriatis; seta elongata, lævi; capsula ovata, inæquali, erectiuscula, subapophysata; operculo convexo, longius rostrato.—On trunks of trees, Forest of Esmeraldos, *Prof. William Jameson*, 1827, (Dr. Greville's Herbarium.)

The setæ, nearly 2 inches high, seem quite disproportioned to the erect shoots that scarcely exceed 2 lines in height. Leaves loosely set, yellowish-green, shining when dry. Calyptra dimidiate. Outer peristome of sixteen trabeculate teeth, inner of as many foraminulose laciniæ, with single, lanceolate, short processes interposed. Apophysis of the capsule short, blackish, obconical.

6. H. *scariosum*; caule laxe implexo; surculis procumbentibus, subpinnatis, virenti-albidis, sericeis; foliis caulinis erectis, rameis patentibus, omnibus cordatis, longius apiculatis, serrulatis, mediotenus uninerviis; seta lævi; capsula ovata, inæquali, inclinata, fuscescente.—On trunks of trees, Forest of Esmeraldos, at an altitude of 7,000 feet, *Prof. William Jameson*, (Dr. Greville's Herbarium.)

Shoots with but little verdure, hence appearing scariose. Leaves destitute of striæ. Inner peristome of sixteen laciniæ, with single filiform processes interposed. From H. *plumosum*, Linn. the present differs by the wider leaves, their more elongated points, by the pinnate branches and by the smooth setæ.

7. H. *solutum*; caule laxe implexo, elongato, subpinnato; ramis fasciculatis, attenuatis; foliis subimbricatis, caulinis late cordatis, elongate apiculatis, squarrosis, rameis ovatis, patentibus, omnibus mediotenus uninerviis, minutissime serrulatis; seta flexuosa, lævi; capsula oblongo-ovata, incurvata; operculo rostrato.—On the ridge of Pisagua, near Otovalo, at an altitude of 10,000 feet, *Prof. William Jameson*, (Dr. Greville's Herbarium.)

Shoots several inches long, variously flexuose, their tops usually with fascicled branches, pale olive-green. Outer

peristome of sixteen trabeculate teeth, inner of as many foraminulose laciniæ with single filiform processes interposed. It is like some states of H. *prolongum*, Linn., but the ultimate branches are more slender, the cauline leaves squarrose, their nerve reaching only half way to their summits and the setæ are smooth.

DALTONIA, *Hook. et Tayl.*, (annuente atque emendante *Bridelio.*)

1. D. *ovalis*; caule cæspitoso, erecto; ramis compressis; foliis imbricatis, erectis, oblongo-lanceolatis, apiculatis, canaliculatis, substriatis, uninerviis, margine reflexis, integerrimis; seta scabra; capsula ovali, apophysi minuta; operculo longirostro.—On trunks of trees, on Cayambe, at an elevation of about 14,000 feet, 20 Oct., 1827, *Prof. William Jameson*, (Dr. Greville's Herbarium).

Shoots of a golden yellow, shining, about 1 inch high and 1-10th of an inch wide. Calyptra entire, ciliated at the base. Outer peristome of sixteen lanceolate-acuminate, barred teeth, inner of as many white, filiform, imperforate, articulated laciniæ, variously twisted after the fall of the lid. Nerve of the leaf very slender, vanishing before reaching the point. This differs from D. *splachnoides*, H. et T., by the greater size, wider leaves with stronger nerves, and by the capsule more contracted at the mouth. It must be confessed, however, that the two species approach very closely.

FISSIDENS, *Hedw.*

1. F. *pygmæus*; caule aggregato, erecto, simplici; foliis erecto-patentibus, infra laxis, apice confertis 7-8-jugis, oblongis, obtusissimis, nervo apiculatis, integerrimis, immarginatis, lamina dorsali acuta, supra basin desinente; perichætio (seu caule fertili) radicali, breviore, ejus foliis erectis, adpressis, amplexantibus, acuminatis, 2-3-jugis; seta subflexuosa; capsula erecta, ovata; operculo rostrato. Swan River, *Mr. James Drummond*.

Stems loosely aggregated, pale green, flexuose. Leaves crisped when dry, obliquely set, the base on one side of the nerve prolonged and rotundate. Lid shorter than the capsule. Teeth of the peristome unequally divided. The fertile stem or perichætium sending down its own rootlets. F. *taxifolius*, Hedw., may be distinguished by its greater size, its leaves in from nine to fifteen pairs, more acute, by the perichætium growing truly on the cauline shoot, by the wider capsules, and by the more elongated and attenuated beaks of the lids. There is no annulus present.

De Caricibus; *by* F. Boott, M.D. F.L.S.

The following species of *Carex* form a natural group in that vast genus, and have not been always clearly understood. As in other groups, it is difficult to convey by language that distinction which the eye perceives; and in many cases the transition of one species into another is so evident, that no single character can be so expressed as to suit, exclusively, any one species, seen under the various forms which a large collection of specimens presents.

To show the differences in the group *Vesicariæ*, I have given a table of the spikes, and of the male and female ones from a large number of specimens examined in various herbaria; and it will be seen that it affords an additional evidence of the specific character of some of the species allied to each other, as in the case of the prevailing number of female spikes in C. *vesicaria* and C. *bullata*, distinguishing the one from C. *ampullacea*, and the other from C. *Tuckermani*.

C. *utriculata* was first described in the Flora Bor. Americana of Sir W. J. Hooker, and though common in the United States, has not been admitted by Tuckerman in his *Enumeratio methodica Caricum*, published in 1843. It has been generally considered by American Botanists as C. *ampullacea*, to which in its smaller forms it is closely allied, but from which, in well developed specimens, it is distinct, especially by the oblong elliptic perigynium, and the long hispid aristate lower

female scales. Specimens exactly agreeing with the usual typical forms of the C. *ampullacea* of Europe were found by Dr. Richardson in Arctic America. I have not seen any like them from the States of the Union. They no doubt will be met with; but I think taking the types of either, few botanists will doubt their specific difference. I have ventured to quote the C. *bullata, var. lævirostris* of Fries, found near Christiana in Norway by Blytt, a specimen of which I saw in *Herb. Tuckerman*, under C. *utriculata.* It cannot possibly be considered as a form of C. *bullata*, and it agrees with C. *utriculata* in having the lower female scales aristate. The fig. of Schk. is conclusive as to C. *bullata*, from which C. *Tuckermani* is clearly distinct.

VESICARIÆ.

	No.	Spikes.	No.	Male.	No.	Female.
	13	4	19	3	19	2
C. monile, 23	8	5	3	2	4	1
	2	3	1	4		
	51	5	56	3	93	2
	44	4	47	2	12	3
	11	6	5	4	8	1
C. vesicaria, 115 . . .	6	3	5	1	2	4
	2	7	1	5		
	1	8	1	6		
	33	5	50	2	49	2
	31	4	25	3	28	3
	13	6	9	4	6	1
	5	7	2	5	5	4
C. ampullacea, 90 . . .	3	3	2	1	1	5
	2	9	1	7		
	1	2	1	11		
	1	11				
	1	15				
	24	6	27	3	33	3
C. utriculata, 50 . . .	18	7	20	4	11	2
	5	5	2	5	5	4
	3	8	1	2	1	5
	25	5	32	2	28	3
C. Tuckermani, 47 . . .	16	4	12	3	17	2
	5	6	2	1	2	1
	1	7	1	4		
	21	4	22	2	23	1
C. bullata, 35	12	3	13	3	12	2
	2	5				

1. C. *monile*, Tuckerman Enum. Meth. Car.

Spicis 4-5, rarius 3, longo-cylindricis; masculis 3, rarius 2-4; fœmineis 2, rarius 1, teretibus remotis, pedunculatis, evaginatis, longe bracteatis, infima nutante basi laxiflora. Stig. 3. Perigyniis subgloboso-ovatis, acuminatis, brevirostratis, ore obliquo bifurcato inflatis, glabris, lucidis, stramineis, sub 10 nerviis, squama lanceolata acuminata acuta multum latioribus, longioribusque.—C. vesicaria, β *Dewey.* —C. bullata, β ? *Sullivant.*

Hab. In Nova Anglia. *Tuckerman*, &c. Ohio, *Sullivant.* Cumberland House to Bear Lake. *Richardson.*

Culmus 1-2 pedalis, gracilis, triqueter, acutangulus, scaber, sulcatus, pars spicas gerens 4-10 poll. longa. Folia 1-2 lin. lata, viridia, scabra. Bracteæ foliaceæ, culmo longiores, infima rarius vaginata. Vagina 2-4 lin. longa. Spicæ masculæ plerumque 3, rarius 2-4, approximatæ, 1-2$\frac{1}{2}$ poll. longæ, lineam latæ, infima bracteata: inferiores rarius, vel omnes apice fœmineæ: squamæ lanceolatæ, castaneæ, margine albo-hyalinæ. Spicæ fæmineæ 2, rarius 1, longo cylindricæ, 1$\frac{1}{4}$-2$\frac{1}{2}$ poll. longæ, 3 lin. latæ, pedunculatæ, nutantes, intervallis 1$\frac{1}{2}$-5 poll. remotæ; squamæ lanceolatæ, acuminatæ, acutæ, muticæ, pallidæ vel ferrugineæ. Pedunculi 4 lin.-1$\frac{1}{2}$ poll. longi, glabri. Perigynium 2 $\frac{5}{9}$ lin. longum, 1$\frac{5}{9}$ lin. latum. Achenium 1$\frac{2}{9}$ lin. longum, $\frac{8}{9}$ lin. latum, triquetro-obovatum, castaneum, glabrum.

A C. *ampullacea* differt culmo acutangulo, scabro, foliis planis, viridibus, spicis fœmineis paucioribus, gracilioribus, squamis muticis, perigyniis ore obliquo. Gracilior quam C. *vesicaria*, et forma fabricaque perigynii, spica fœminea infima basi laxiflora, perigyniis sæpe trifariis, aliisque notis, distinguenda.

2. C. *vesicaria*, L.

Spicis 5-4, rarius 3-6 vel pluribus; masculis 3-2, fœmineis 2, rarissime 3 vel 1, oblongis vel cylindraceis, crassis, approximatis, bracteatis, infima pedunculata. Stig. 3. Perigyniis oblongo-ovatis, acuminato-brevi rostratis, bifurcatis, glabris, stramineis, inflatis, 10-17 nerviis oblique adscenden-

tibus, squama lanceolata acuta vel acuminata mutica longioribus latioribusque.

HAB. In Europa, Altai; America boreali.

Culmus 1-2 pedalis, acutangulus, scaber, pars spicas gerens 3-10 poll. longa. Folia 2-3 lin. lata, scabra, culmum æquantia, viridia, vaginis in filis reticulatis rumpentibus. Bracteæ foliaceæ, culmum subæquantes vel eo longiores, infima rarius vaginata. Vagina 2-8 lin. longa. Spicæ 5-4-rarius 3-8: masculæ 3-2, rarius 1-6, plerumque contiguæ, 6-21 lin. longæ, 1-2 lin. latæ, infima bracteata; fœmineæ sæpius 2, rarissime 1-4 crassæ, 8 lin.-2 poll. longæ, 5-6 lin. latæ, approximatæ, intervallis 1-2 poll. vel- infima (si 3 adsint) 5 poll. longis remotæ: suprema sæpe sessilis, infima, pedunculata, erecta vel nutans, rarius basi sublaxiflora. Squamæ lanceolatæ, muticæ obtusæ vel acutæ vel longe acuminatæ (vix perigynio breviores) pallide ferrugineæ vel fuscæ, margine albo-hyalinæ. Pedunculi 2 lin.-1$\frac{1}{2}$ poll. longi scabri. Perigynium 3$\frac{7}{9}$ lin. longum, 1$\frac{3}{9}$ lin. latum-oblongo ovatum, in rostrum breve sensim acuminatum, apice 10-basi 17 nervium. Achenium lineam longum $\frac{5}{9}$-$\frac{6}{9}$ lin. latum, triquetro-obovatum, glabrum, punctulatum.

A C. *ampullacea*, culmo acutangulo, scabro, foliis viridibus, planis, latioribus, spicis fœmineis fere semper 2, crassioribus, brevioribus, rarius basi laxifloris, forma et magnitudine perigynii, perigyniis laxioribus, rostro breviori latiori, squamis longioribus semper muticis, sæpe ad apicem lineari-elongatis, satis distincta.

3. C. *ampullacea*, Good.

Spicis 5-4, rarius 3-6 vel pluribus; masculis 2-3, fœmineis 2-3, longo-cylindricis, remotis, sessilibus vel pedunculatis, longe-bracteatis, densifloris, infima sæpe nutante basi laxiflora. Stig. 3. Perigyniis subgloboso-ovatis, brevi-cylindrico-rostratis, bifidis, glabris, stramineis, oblique adscendentibus, 10-17 nerviis, squama ferruginea, vel fusco-purpurea, margine albo-hyalina, lanceolata mutica et mucronulata longioribus, latioribusque.

HAB. In Europa, Altai, America boreali (*Cumberland House*

to Bear Lake, Richardson), nusquam a civitatibus Reipublicæ Americanæ a me visa.

Culmus subbipedalis, gracilis, obtusangulus, lævis, inter spicas scabriusculus pars spicas gerens 6-13 poll. longa. Folia 1-2 lin. lata, culmo longiora, margine carinaque scabra, sæpius involuta, glauca. Bracteæ culmo longiores, basi involutæ, infima rarius vaginata. Vagina 2-10 lin. longa. Spicæ masculæ plerumque 2 vel 3- rarius 4-approximatæ, 8 lin.-2½ poll. longæ, 1-1½ lin. latæ infima (si 3 adsint) bracteata. Spicæ fœmineæ plerumque 2 vel 3, rarius 4-5-oblongæ vel longo-cylindricæ, 1-2 etiam 3½ poll. longæ, 4-5 lin. latæ, densifloræ, sessiles vel potius inferiores pedunculatæ, superiores interdum apice masculæ, infima basi laxiflora, nutans: squamæ omnes ferrugineæ, vel fusco-purpureæ nervo viridi, margine anguste albo-hyalinæ obtusæ, vel superiores sæpius mucronulatæ rarius emarginatæ, mucrone interjecto. Pedunculi 4 lin.- 2 poll. longi, læves. Perigynium 2 lin. longum, 1-1$\frac{2}{9}$ lin. latum, cylindrico rostratum, ore bifido vel bifurcato, ad basin 17 nervium, ad apicem 10, nervi sursum evanescentes, 8-10 farium. Achenium $\frac{7}{9}$-$\frac{8}{9}$ lin. longum, $\frac{5}{9}$-$\frac{6}{9}$ lin. latum triquetro-obovatum, punctulatum castaneum glabrum.

Variat 1, foliis, planis latis: 2, spicis rarius 9-15 fœmineis 7-11: 3 interdum superioribus apice masculis, 4 infima (uno specimine) basi spicula minori 1 vel 2 aucta.

Specimina Americana omnia (sub nomine C. ampullaceæ missa) quæ adhuc visi, e civitatibus Reipublicæ ad C. *utriculatam* refero. Ea e amiciss. Sartwell. *Penn Yan. N. York* missa, magis cum planta Europæana conveniunt, quæ nunquam squamas fœmineas inferiores aristatas habet, quamvis superiores sæpe mucronulatæ sint. Folia angustata, sæpius involuta, culmus obtusangulus lævis, sunt.

4. C. *utriculata*, Boott. Fl. Bor. Am. 2, 15.

Spicis 6-7, rarius 5-8, masculis 3-4, approximatis, fœmineis 3-4 elongatis, crassis, remotis, sessilibus vel brevi pedunculatis-infima basi laxiflora longe bracteata. Stig. 3. Perigyniis ob-

longo-ellipticis, acuminatis, cylindrico rostratis, bifurcatis, divergentibus, sub 12 nerviis stramineis, squama lanceolata acuminata, hispido-aristata longioribus latioribusque. C. ampullacea, *Dewey*, &c. C. physocarpa, *Sartwell, Herb. Boott.* C. bullata, *β. Fries? Nov. Pl. Suec. man. altera Upsaliæ*, 1839.

HAB. In America Boreali, e civitate Ohio, *Sartwell:* ad "Cumberland House," *Richardson:* in montibus Saxosis. *Drummond:* ad littera Oceani Pacifici, *Garry.*—In Norvegia ?-prope Christianam, *Blytt.* (*Herb. Tuckerman.*)

Culmus 2-3 pedalis, basi spongiosus, crassus, apice lævis vel scaber, inter spicas scabriusculus pars spicas gerens 9-12 poll. longa. Folia 4½ lin. lata, culmo multum longiora, glauca, nodosa, striato-nervosa, carina margineque scabra basi culmum amplectentia. Bracteæ culmum longe superantes, auricula obtusa amplectens, rarius vaginata. Vagina interdum pollicaris. Spicæ masculæ 3-4 rarius 5 vel 2, graciles, 1-2½ poll. longæ, lineam latæ; inferiores bracteatæ, interdum apice fœmineæ: squamæ lanceolatæ, acutæ, pallide ferrugineæ, apice albo-hyalinæ. Spicæ fœminæ sæpe 3- vel 2- rarius 4-5, crassæ, 2½-4 poll. longæ, 7-8 lin. latæ intervallis 1½-3½ poll. remotæ, superiores sessiles, aliquando apice masculæ, rarius basi spicula altera auctæ, quasi geminatæ: inferiores brevi pedunculatæ, apice densi-basi laxi-floræ (infima, uno specimine, basi composita.) Squamæ ovato-lanceolatæ acutissimæ, inferiores præcipue in aristam longam scabram productæ (perigyniis vix breviores.) Pedunculus infimus 8-12 lin. longus, lævis. Perigynium 4$\frac{4}{9}$ lin. longum, 1½ lin. latum, oblongo ellipticum, acuminatum, cylindrico-rostratum, bifurcatum divergens. Achenium lineam longum, $\frac{7}{9}$ lin. latum, triquetro-obovatum, papilloso-asperulum vel punctulatum.

In speciminibus bene expositis satis a typis C. *ampullaceæ* et C. *vesicariæ* distinguenda: in minoribus proxime ad C. *ampullaceam* accedit. Ab utrinque squamis fœmineis longe hispido aristatis satis differt,—a C. *vesicaria* omnibus

partibus majoribus, foliis latioribus glaucis, insigniter venoso-reticulatis, bracteis multum longioribus: spicis pluribus, fœmineis rarius 2- sæpius 3, inferioribus basi magis attenuatis laxifloris, perigyniis longioribus, rostro cylindrico longiori differt.—A C. *ampullacea* pluribus characteribus supra notatis absimilis, præcipue perigyniis oblongo-ellipticis. Tamen hæc perigynii forma interdum deficit, et magis globosa, culmus lævis et obtusangulus et etiam squamæ (*nisi infimæ*) muticæ evadunt—et, ut in aliis Caricis gregibus, sunt formæ intermediæ quæ ad speciem veram ægre relatæ sunt.

5. C. *Tuckermani*, Boott.

Spicis 5-4, rarius 6, masculis 2 vel 3, fœmineis 3 vel 2, oblongis vel cylindraceis, crassis, subapproximatis, pedunculatis, longissime bracteatis infima sæpe nutante. Stig. 3. Perigyniis tenuissimis, pellucidis, turgide-inflatis, oblongo ovatis, acuminatis, longe cylindrico-rostratis bifurcatis, pallidis, oblique-adscendentibus 10-14 nerviis, glabris, squama ovata-acuta vel hispido-mucronata multum latioribus longioribusque.—C. bullata, *Tuck. En. Meth. Car. (non Schk.)*

Hab. in America boreali.

Culmus 2-2½ pedalis, firmus, scaber, foliis vestientibus tectus, apice filiformis, pars spicas gerens 6-10 poll. longa. Folia 1-2½ lin. lata, culmo longiora, scabra. Bracteæ culmo longiores, infima rarius vaginata. Vagina 2-10 lin. longa. Spicæ 5-4, rarius 6 vel 7, masculæ sæpius 2 vel 3, rarius 1-4, ebracteatæ ½-1½ poll. longæ, lineam latæ, interdum apice fœmineæ. Squamæ lanceolatæ, obtusæ velacutæ, vel rarius hispido-mucronatæ, pallide-ferrugineæ margine albo-hyalinæ. Spicæ fœmineæ sæpius 2 vel 3, rarius 1-4, crassæ, 8 lin. ad vix 2 poll. longæ, 8 lin. latæ, suprema subsessilis, infima pedunculata, nutans, intervallis 1-2, rarius 4 poll. remotæ: squamæ ovatæ, acutæ vel hispido-mucronatæ pallidæ, nervo viridi, ad latera ferrugineo-nebulosæ, margine albo-hyalinæ, glabræ vel dorso scabræ. Pedunculi 2 lin. ad 1 poll. longi, scabri. Perigynium 5 lin. longum, 2 lin. latum, tenue, pellucidum,

viride vel stramineo-pallidum. Achenium $1\frac{3}{9}$ lin. longum; lineam latum triquetrum pallidum papilloso-asperulum, basi styli incrassato apiculatum.

A C. *bullata*, Schk., culmo scabriori foliis latioribus, spicis fœmineis longioribus, pluribus, longius pedunculatis, nutantibus. Squamis sæpe mucronatis, perigyniis tenuioribus, pellucidis, majoribus, glabris, oblique-adscendentibus, pedunculis scabris differt.

6. C. *bullata*, Schk. U. U. U. f. 166.

Spicis 4-3, masculis sæpius 2 vel 3, approximatis, infima bracteata, fœmineis 1, rarius 2, oblongis vel cylindraceis, crassis, squarrosis, sessilibus vel pedunculatis, bracteatis. Stig. 3. Perigyniis ovatis, acuminatis, longe cylindrico-rostratis, bifurcatis, inflatis, rostro sæpius scabro, 10-14 nerviis, squama lanceolata, acuta, mutica multum latioribus, longioribusque.—C. cylindrica, *Tuck. En. Meth. Car. &c.*
Hab. in America boreali.

Culmus $1\frac{1}{2}$-2 pollicaris, gracilis, firmus, lævis vel scabriusculus, inter spicas scaber, pars spicas gerens 4-8 poll. longa. Folia 1-$1\frac{3}{4}$ lin. lata. Bracteæ culmum subæquantes, vel eo longiores, infima rarius vaginata. Vagina 4 lin. longa. Spicæ 4-3, rarius 5, masculæ sæpius 2 vel 3, approximatæ, $\frac{1}{2}$-2 poll. longæ, 1-$1\frac{1}{2}$ lin. latæ, suprema aliquando basi fœminea infima bracteata. Squamæ obtusæ castaneæ, margine et apice albo-hyalinæ. Spicæ fœmineæ sæpius 1- rarius 2, squarrosæ, 10-16 lin. longæ, 6-8 lin. latæ, sessiles vel brevi pedunculatæ, rarius apice masculæ, intervallo 2-4 poll. remotæ, squamæ castaneæ muticæ margine albo-hyalinæ. Pedunculi 4 lin. rarius pollicem longi, læves, infimus interdum subnutans. Perigynium $3\frac{7}{9}$ lin. longum, $1\frac{7}{9}$ lin. latum, longe-cylindrico-rostratum rostro sæpius scabro, squarrosum. Achenium $1\frac{8}{9}$ lin. longum, $\frac{6}{9}$ lin. latum, triquetrum, fuscum, papilloso-asperulum, basi styli incrassato apiculatum.

Notes on Mimoseæ, *with a Synopsis of Species.* By George Bentham, Esq. (*with a Plate.* Tab. I.)

Tribe III. Acacieæ.

(*Continued from Vol. IV. p.* 622.)

XXIX. Affonsea, *A. de St. Hil.*

(Tab. I.)

Flores hermaphroditi. Calyx ample tubuloso-campanulatus, subinflatus, 5-8-dentatus. *Corolla* tubulosa. *Stamina* numerosissima, monadelpha, tubo basi corollæ adnato, filamentis superne liberis longe exsertis. *Ovaria* plura, sessilia. *Styli* elongati exserti. *Legumen* crassum rectum. *Semina* funiculo longo appensa.—Frutices v. arbores, Brasilienses, *habitu* Ingæ, *inermes.* Folia *simpliciter abrupte pinnata.* Petiolus *inter juga foliolorum alatus v. nudus.* Glandulæ *inter omnia paria scutellatæ v. stipitatæ.* Foliola *opposita, paucijuga, majuscula.* Flores *inter Mimoseis magni, nunc sessiles dense spicati, nunc breviter pedicellati, racemosi.* Bracteæ *vel breves laxæ vel dense imbricatæ.* Calyx *et* corolla *villosa.* Stamina *et* styli *glabra.* Ovaria *brevia villosissima.*

This genus was established many years since by Auguste de St. Hilaire, and often adverted to upon his authority, but does not appear to have been since examined, although more than one species have been gathered in the vicinity of Rio Janeiro, or Bahia. This circumstance is probably owing to their having been taken for species of *Inga*, which they resemble most closely in every thing but the number of ovaria, and some slight difference in the calyx and corolla.

The number of ovaries is usually three, of which one appears to be the front one and two lateral ones, the seminal suture being always, as might be expected, turned towards the central axis of the flower. I only twice found five, regularly placed round the central axis, and once I met with six, the additional one being in the centre of the five others.

Where there were five, the odd one appeared to be placed in front, but of this I am not certain, for owing to the thick texture and obscure venation of the calyx, corolla and staminal tube, I cannot satisfy myself that I traced their relative position very accurately. I had not many flowers to spare for dissection, and in those cases where I made a transverse section in the first instance, they turned out to be only tricarpellary.

1. A. *juglandifolia*, (A. de St. Hil. Voy. Diam. 1, p. 387), foliolis 4-jugis, racemis longiuscule pedunculatis.—Unknown, except from the above short character.—Diamond District.

2. A. *densiflora*, sp. n., foliis glabris, petiolo nudo, foliolis 3-4-jugis oblongis acuminatis coriaceis nitidis planis, spica ovoidea densa pedunculo suo longiore.—Ramuli juniores rufo-pubescentes, mox glabrati. Stipulæ persistentes, lanceolatæ, 2-3 lin. longæ. Petiolus communis 4-5-pollicaris. Glandulæ orbiculatæ, sessiles. Foliola ultima 5-6 poll. longa, 1½-2 poll. lata. Pedunculus in specimine nostro sesquipollicaris, crassus. Spica crassissima, bipollicaris. Bracteæ ovato-lanceolatæ, membranaceæ, viscoso-pubescentes, floribus vix breviores et cum iis imbricatæ. Calyx sessilis, 8 lin. longus, inflatus, viscoso-tomentosus, inæqualiter 6-8-dentatus. Corolla pollicaris, dense tomentoso-villosa. Tubus stamineus inclusus; filamenta corolla duplo longiora; antheræ dorso verrucosæ; pollinia in quoque loculo 4. Ovaria 3-5.—Bahia, *Blanchet*, n. 1684.

3. A. *comosa*, sp. n. (Tab. I.), ramulis petiolis nervisque foliolorum hirtellis, petiolo superne alato, foliolis bijugis oblongis v. oblongo-ellipticis coriaceis nitidis planis, racemo ovoideo pedunculo suo breviore. — Ramuli juniores pilis brevibus hirtelli. Petiolus bipollicaris, ala utrinque 1½ lin. lata, a foliorum pari supremo usque ad medium internodii attingens, v. paullo infra extensa. Foliola ultima 4-6 poll. longa, 1½-2½ poll. lata. Pedunculi 1½-3-pollicares, rufo-hirti. Flores fasciculati, approximati in racemum 2-3-pollicarem. Bracteæ patentes, ovato-oblongæ, concavæ, hirtæ, 3-4 lin. longæ. Calyx 9 lin. longus, ovoideo-inflatus, rufo-villosus.

Corolla angusta, calycem breviter excedens, extus villosissima. Filamenta corolla vix duplo longiora. Ovaria vidimus 3, adjecto rarius quarto minore. — Rio Janeiro, *Tweedie*, n. 1217.

Plate I. Affonsea comosa; *Fig.* 1. Section of the corolla and staminal tube, showing the three ovaries; *f.* 2. ovaries; *f.* 3. transverse section of the same.

4. A. *bullata*, sp. n.; ramulis petiolis nervisque foliolorum subtus rufo-hispidis, petiolo alato, foliolis 3-5-jugis oblongo-lanceolatis supra sparse pilosis demum glabris bullatis, spicis densis ovoideis pedunculo sublongioribus. — Arbor parva. Stipulæ lato-lanceolatæ, 2-3 lin. longæ. Petiolus communis 3-4-pollicaris, alis utrinque 1-1½ lin. latis. Glandulæ parvæ, longe stipitatæ, iis *Ingarum Vulpinarum* similes. Foliola ultima 6-9 poll. longa, 1-1¼ poll. lata, inter venas valde bullata, supra siccitate plumbeo-colorata. Pedunculi ad apices ramorum 2-4, corymboso-racemosi. Spicæ breviter ovoideæ. Bracteæ lato-lanceolatæ calyce vix breviores. Calyx amplus, membranaceus, hispidus. Corolla calyce paullo longior, hirsutissima. Ovaria 2-5, et semel observavi 6. Legumen junius abortu solitare, lineare, crassum, villosissimum, circa 8-spermum.—Rio Janeiro, *Cayley*, Jurujuba Bay, *Gardner*, n. 750.

ADDITIONS AND CORRECTIONS TO THE FORMER PORTIONS OF THIS PAPER.

ERYTHROPHLEUM, *Afz.* — Fillæa, *Guillem. et Perrot.*—*Benth. in Hook. Journ.* 4, *p.* 327.

E. *guineense*, Don. Gen. Syst.—Fillæa suaveolens, *Guill. et Perr. l. c.*—I have now seen Afzelius' specimen at the British Museum, which fully proves the identity of the two plants.

PARKIA, *Hook. Journ.* 4. *p.* 328.

Hostmann's Surinam specimens, n. 1012, a fine specimen collected by Schomburgk in his last expedition, and a leaf

gathered by Riedel in North Brasil, and now in the herbarium of the Imperial Academy of Saint Petersburgh all belong to a species of Parkia, very distinct from P. *biglobosa*, but which is probably the same as *Inga filicina*, Willd.

Two additional species of *Parkia*, P. *speciosa* and P. *intermedia*, both from Java, are published by Hasskarl, Hort. Bogor. p. 289, where the P. *grandis*, formerly so named by him, and published from his MS. in the Ratisbon Flora and in Walp. Rep. 2, p. 905, is now referred to the common P. *biglobosa*, of which Javanese specimens are contained in Zollinger's collection, n. 736.

PENTACLETHRA, *Hook. Journ.* 4, *p.* 330.

P. *filamentosa*, add : Surinam, *Hostmann*, n. 1033.—British Guiana, *Schomburgk*, 1*st Coll.* n. 498, 2*nd. Coll.* n. 105 (53). *Cailliea macrostachia*, Steud. Flora, 1843, p. 759.—Legumen fere pedale, pollicem latum, falcatum, compressum, lignosum, suturis leviter incrassatis, faciebus longitudinaliter et oblique lineatis, basi angustatum.

P. *brevifila* may possibly be a mere variety of P. *filamentosa*. The *Acacia aspidoides*, G. F. W. Mey., which I had suggested might be a *Piptadenia*, has been referred in the British Museum, and with reason, to *Pentaclethra filamentosa*.

ENTADA, *Hook. Journ.* 4, *p.* 332.

E. *scandens*, p. 332.—To this species belong Cuming's n. 1260 and 1692 from the Philippine Islands.

E. *polystachya*, p. 332.—British Guiana, *Schomburgk*, 2nd *Coll.* n. 494 (767).

E. *polyphylla*, p. 333.—British Guiana, *Schomburgk*, 1st. *Coll.* n. 604.

E. *Natalensis*, p. 333.—Port Natal, Krauss, n. 199.

E. *abyssinica*, (Steud. in Schimp. Pl. Abyss. exs. Sect. II, n. 520), ramulis petiolisque glabris (inermibus?) pinnis 15-20-jugis, foliolis multijugis oblique linearibus obtusis glabris, spicis fructiferis axillaribus.—Mountainous tract, Schire Dochogardi, in Abyssinia, *Schimper*.—Evidently allied

to E. *natalensis*, but the leaflets are smaller, narrower, and much more numerous. The pod, about eight inches long and two broad, is precisely that of an *Entada*, though thin.

E.? *myriadenia*, p. 333.—Acacia paniculæflora, *Steud. Flora*. 1843, p. 760.—Rio Negro, in North Brazil and British Guiana, *Schomburgk*, *1st Coll.* n. 917; *2nd Coll.* n. 852 (1474); Surinam, *Hostmann*, n. 152.—The pod has not yet been received.

E. *Gandu*, Hoffm. ex Walp. Rep. 1, p. 858, is unknown to me.

PIPTADENIA, *Hook. Journ.* 4, p. 334.

After P. *latifolia*, p. 335, add:

P. *patens*, (Benth. Bot. Sulph. p. 89), scandens, ramulis petiolisque pubescentibus aculeatis, pinnis 3-4-jugis, foliolis subtrijugis obovatis glabris v. basi ciliatis, corolla calyce triplo longiore, staminibus corolla dimidio longioribus, ovario brevissime stipitato villoso.—*Inga patens*, Hook. et Arn. Bot. Beech. p. 419.—Realejo, *Sinclair*.—Very near P. *latifolia*, but the panicle larger, the flowers smaller, and the proportion of the parts somewhat different.—Ejusdem var. *macrophylla*; Tiger Island, Gulf of Fonseca, *Sinclair*.

P. *guianensis*, p. 335.—British Guiana, *Schomburgk*, *2nd Coll.* n. 799 (1433)? without fruit. The habit is nearly that of *Stryphnodendron polyphyllum*.

After P. *filicoma*, (by mistake spelt *filicicoma*), p. 336, add:

P. *suaveolens*, (Miq. Linnæa, 18, p. 589), inermis, ramulis petiolisque puberulo-hirtellis, glandula in petiolo lineari impressa, pinnis 6-10-jugis, foliolis multijugis dimidiato-subfalcato-linearibus acutiusculis basi truncata sessilibus rigidis supra nitidis glabris subtus fuscescenti-glaucis tenerrime appresso-puberulis sensim glabratis nervo excentrico, spicis axillaribus solitariis vel geminis breviter pedunculatis tomentellis, floribus appresse hirtellis.—Woods near Bergendaal, in Surinam. A tall tree with aromatic flowers, called by the natives, Kousà.—Unknown to me.

P. *viridiflora*, p. 337.—Guayaquil, *Hartweg*, n. 653.

After P. *moniliformis*, p. 339, add:

P. *polystachya*, (Miq. Linnæa, 18, p. 590), ramulis petiolisque subtiliter subleproso-tomentellis, pinnis 3-4-jugis, foliolis 4-7-jugis ovato- vel elliptico-lanceolatis acuminatis acumine obtuso æquilateris supra nitidis subtus fuscescentibus utrinque præter nervum supra pubescentem glabris, glandulis infra pinnas v. folia pleraque, spicis densifloris paniculatis fusco-tomentosis basi vaginato-bracteatis, calyce pubescente, corolla glabra, ovario breviter stipitato hirsuto.—Surinam, near Bergendaal.—Unknown to me.

P. *peregrina*, p. 340.—North Brasil and Guiana, *Schomburgk, 1st. Coll.* n. 852 and 866; *2nd Coll.* n. 396 (433).

P. *colubrina*, p. 341.—Mart. Herb. Fl. Bras. n. 1105.

STRYPHNODENDRON, *Hook. Journ.* 4, *p.* 341.

Before S. *Barbatimam*, p. 342, insert:

S.? *paniculatum*, (Pœpp. et Endl. Nov. Gen. et Sp. 3, d. 81, t. 291), pinnis 2-3-jugis, foliolis 3-4-jugis ovatis acuminatis, panicula terminali ramosa, spicis ternis.—Near Ega, on the Amazon River, *Pœppig*. Unknown to me, but the appearance of the plant, as represented in the plate, is so much that of *Piptadenia paniculata*, that in the absence of the pod it ought rather to be referred to that genus. It would differ specifically from P. *paniculata* in the hairiness of the ovary and some other points.

After S. *discolor*, p. 342, add:

S. *microstachyum*, (Pœpp. et Endl. l. c. p. 82) ramulis teretibus petiolisque ferrugineo-puberulis, pinnis 5-7-jugis, foliolis 8-10-jugis oblique rhombeo-oblongis supra nitidis subtus glaucis minute puberulis, spicis folio 3-4-plo brevioribus.—Folia adulta fere pedalia. Foliola 6-9 lin. longa, 3-4 lin. lata, ultima obovata, cœtera obtusa, basi valde inæqualia. Spicæ 2-3-pollicares. Corolla linea brevior. Legumen ignotum.—Borba on the Rio da Madeira. *Riedel*; on the Amazon, *Pœppig*. I had named this plant in the Petersburgh collection S. *inæquale*, sp. n., before I received the

last part of Pœppig's work, whose description perfectly agrees with the plant before me, except that his measurements of the leaflets and flowers are rather smaller.

S. *polyphyllum*, p. 342.—Mart. Herb. Fl. Bras. n. 1102.

ADENANTHERA, *Hook. Journ.* 4, *p.* 343.

A. *pavonina*, p. 343.—Philippine Islands, *Cuming*, n. 1691.

ELEPHANTORRHIZA, *Hook. Journ.* 4, p. 344.

Burke's collection from the Macalisberg district contains specimens in flower and fruit of two forms, which appear to be distinct species although it is difficult to assign positive characters to them. In the one E. *Burchellii*, Benth. l. c., the leaflets are generally three or more pair to each pinna, and when full grown scarcely more than 3 or 4 lines long, the flower spikes from 2 to 2½ inches. In the other E. *Burkei*, sp. n., the leaflets are much more than twenty pair to each pinna, and near 6 lines long, and the flower spikes from 4 to 5 inches.

PROSOPIS, *Hook. Journ.* 4, *p.* 346.

Engelmann and Gray, Pl. Lindheim, p. 34, describe the fruit of P. *glandulosa* as having the inner lining of the carpel hardened into distinct almost bony husks round each seed, and they state that there is the same structure, except that these husks are thin and paper-like in P. *dulcis*, whilst in the section *Strombocarpa* this lining is continuous through the pod, and they suggest the adoption as distinct genera of the three sections *Adenopis* or true *Prosopis*, *Algarobia*, and *Strombocarpa*; but striking as some of these differences in the pod are, their adoption as generic characters would (as in the case of the *Acaciæ gummiferæ*) make it necessary to establish a separate genus for almost every species of which the pod is known to us, and as a whole *Prosopis* may be distinguished from the allied genera by the pod which is indehiscent (or nearly so), with a membranous or crustaceous

epicarp, a sweet fleshy continuous sarcocarp, and a membranous crustaceous or bony endocarp either continuous or separated into distinct articulations, thus differing from *Piptadenia* and *Mimosa,* in both of which there are species with and without transverse articulations, by the presence of the sarcocarp.

P. *Stephaniana,* p. 347.—Mesopotamia, *Kotschy,* n. 434; Affghanistan, *Griffith,* n. 1191.

P. *dulcis,* p. 349.—Mexico, *Jurgensen,* n. 297; *Galeotti,* n. 3243; Venezuela, *Funcke,* n. 455.

P.? *heterophylla,* sp. n.; glabra, petiolis longissimis complanatis, pinnis 1-2-jugis v. abortivis, foliolis 12-15-jugis oblique oblongis parvis, spicis subsessilibus folio brevioribus, legumine plano marginibus incrassatis.—Sonora alta in Mexico, *Coulter.* Although I have not seen the flower of this plant, and the pod is thinner than usual (about 4½ inch long and 5 lines broad) the general habit of the plant is much more that of a *Prosopis* than of any other genus. It is most remarkable by the almost phyllodineous vertical expansion of the common petiole, which is from 3 to 7 inches long, and about a line or a little more or less broad. I have seen but a single specimen in the herbarium of Trinity College, Dublin.

To the doubtful species (probably of the section *Algarobia*) must be added P. *fæculifera,* Desv. Ann. Sc. Nat. Par. Ser. 1, v. 9, p. 426, or *Inga fæculifera,* Desv. in Ham. Prod. Ind. occid. p. 61.

After P. *strombulifera,* p. 352, add:

P. *pubescens,* sp. n.; stipulis spinescentibus subulato-conicis foliorum pinnis plerisque unijugis, foliolis 5-8-jugis oblongis obovatisve obtusis puberulis, spicis elongatis pubescentibus subinterruptis, corolla calyce duplo longiore, staminibus exsertis, antheris glanduliferis, legumine dense spiraliter contorto.—Frutex, habitu ad P. *strombuliferam* accedens, inflorescentia distinctissimus. Foliorum petiolus communis 2-4 lin. longus, pinnæ pollicares, foliola 3-4 lin. longa v.

ultima paullo longiora. Legumen sesquipollicare, cylindricum, constans e cochleis 12-20 arctissime approximatis. —California between San Miguel and Monterey, *Coulter*.

If the pods in all the *Strombocarpas* were like those of this species and the P. *strombulifera*, they might be easily characterised as a distinct genus; but that of P. *torquata* is intermediate between them and the *Algarobas*.

P.? *striata*, sp. n.; glabra, ramulis crassis costato-striatis apice attenuato-subspinescentibus, stipulis spinescentibus recurvis, pinnis unijugis, foliolis 2-3-jugis oblongis, pedunculis folio longioribus, capitulis globosis, petalis glabris, ovario villoso.—Ramuli virides, nitidi, nonnulli compressi, omnes costis flavicantibus striati. Stipulæ parvæ, valde recurvæ. Folia pauca; petioli communes breves, pinnæ semipollicares v. paullo longiores; foliola 3 lin. longa, rigidula. Pedunculi solitarii v. gemini, 8-10 lin. longi. Flores virides. Calyx brevis, truncatus, minute 4-dentatus. Petala 5, omnino glabra, basi diu cohærentia. Stamina 10, corolla duplo longiora; antherarum glandula majuscula.—Port St. Helena, South America, Captain King. The pod being unknown the genus of this plant must remain doubtful. The anthers are glanduliferous as in *Prosopis* but there is no wool at the extremity of the petals.

DICHROSTACHYS, *Hook. Journ.* 4, *p.* 353.

D. *nutans*, p. 353.—*Acacia spinosa*, E. Mey. Comm. Pl. Afr. Austr. 1, p. 170.—*Mimosa sanguinea*, Bruce, Trav. 5, p. 34 cum ic.—Abyssinia, *Schimper*, Sect. 2, n. 704; Macalisberg, *Burke*.—According to Krauss' Flora 1844, p. 359, this is also D. *caffra*, Meissn. Krauss' n. is however wrongly quoted 248, instead of 148 (248 being a *Hypoxis*) and n. 326, which is in my set without doubt the same plant, is erroneously referred (though with a doubt) to *Acacia cinerea*, Spr. or D. *cinerea*.

NEPTUNIA, *Hook. Journ.* 4, *p.* 354.

N. *oleracea*, p. 354.—Cordofan, *Kotschy*, n. 204; Guayaquil, *Hartweg*, n. 654.

DESMANTHUS, *Hook. Journ.* 4, *p.* 356.

D. *virgatus*, p. 357.—Rio Teapa, South Mexico, *Linden*, n. 739; Bay of Magdalena, South California, *Hinds*.

D. *depressus*, p. 357.—D. *pratorum*, Macfad. Fl. Jam. 1, p. 311.

After D. *acuminatus*, p. 357, add.

D. *incurvus*, sp. n.; diffusus, glabriusculis, pinnis 2-5-jugis, foliolis 10-15-jugis, glandula parva v. deficiente, leguminibus falcatis hirtellis 6-8-spermis, seminibus ovatis.—Habitus D. *depressi* sed legumen inter illa D. *depressi* et D. *brachylobi* medium. Differt insupera D. *acuminato*, legumine latiore breviore minus acuminato et pilis brevibus consperso. Semina nunquam vidi plus quam 8 et leguminis valvæ inter semina obscura transverse lineata. — Mexico between Real del Monte and Zacatecas, *Coulter*.

Mimosa pumila, Schlecht. Linnæa, 12, p. 557 is probably a *Desmanthus* and from the description would appear to differ only from *D. incurvus* in the breadth of the pod, which is stated to be 3 lines instead of 2 as in D. *incurvus*.

MIMOSA, *Hook. Journ.* 4, *p.* 358, *to* 413.

M. *albida*, p. 360.—Acapulco, *Sinclair*.

M. *floribunda*, p. 360.—M. *monilifera*, Bertol.? Fl. Guatem. p. 41.—Mexico, *Galeotti*, n. 3329; *Linden*, n. 683; New Grenada, *Linden*, n. 1500; Santa Martha, *Purdie*; Guayaquil, *Hinds, Sinclair*.

M. *rixosa*, p. 361.—M. *violacea*, Bonpl.?—Walp.? Rep. 2, p. 905. After which add:

M. *Hostmanni*, sp. n.; aculeis retrorsis parvis raris, ramulis petiolisque ferrugineo-hirsutis pubescentibusque, foliolis oblique obovali-oblongis obtusis mucronulatis utrinque strigoso-pilosis, pedunculis capitulo duplo longioribus, bracteolis corollas subæquantibus, legumine recto vix acuminato undique dense ferrugineo-setoso.—Affinis M. *rixosæ* sed legumen minus, setis minus rigidis, in faciebus creberrimis, marginalibus fere minoribus.—Surinam, *Hostmann*, n. 1233.

M. *notata*, Steud. Flora 1843, p. 758, belonging to this

section is insufficiently described and unknown to me.—Surinam, *Hostmann*, n. 1205.

M. *platyphylla*, sp. n.; suffruticosa, inermis, undique setis rufis hirsutissima, foliolis oblique obovatis obtusis utrinque hirsutis, pedunculis capitulo longioribus, bracteolis elongatis subulatis setoso-hispidis.—Species foliolorum amplitudine insignis. Caules sesquipedales, erecti. Foliola 2-2½ poll. longa, 15-20 lin. lata, crassiuscula; intimum minimum v. nullum. Capitula numerosa. Bracteolæ 2-2½ lin. longæ.—Camapua in Brasil, *Riedel*, a single specimen in the Imperial Herbarium, St. Petersburgh.

M. *paniculata*, p. 362 is an error of the press, it should be M. *pauciseta*. After M. *angusta*, p. 362 add:

M. *gymnoloma*, sp. n.; suffruticosa, inermis, glaberrima, foliolis oblique linearibus marginatis nudis, bracteolis corollas subsuperantibus.—Caulis erectus, strictus. Foliola majora 3 poll. longa, vix 2½ poll. lata, in altero specimine multo minora sed angustiora quam in M. *angusta* et minime ciliata. Capitula bracteolis eminentibus echinata.—Camapua in Brasil, *Riedel*.

After M. *viva*, p. 363, add:

M. *Skinneri*, sp. n.; herbacea, humilis, diffusa, aculeis infrastipularibus rectiusculis geminis, caule petiolis pedunculisque longe patenti-pilosis, stipulis lanceolatis, pinnis petiolo subbrevioribus, foliolis 4-8-jugis oblique obovali-oblongis supra glabris subtus longe pilosis, pedunculis axillaribus petiolos æquantibus, capitulis globosis, calyce minuto, leguminis articulis 3-4 stellato-puberulis medio nudis, margine setoso.—Herbula vix M. *viva* major, sed hirsutie aliisque characteribus abunde distincta. Pili caulis et foliorum longi rufescentes.—Cuesta of Leone, Guatemala, *Skinner*.

M. *dominiciana* (Desv. Ann. Sc. Nat. Par. Ser. 1, v. 9, p. 424) aculeata, pinnis unijugis, petiolis petiolulisque aculeatis, foliolis 4-jugis dimidiatis late ovatis cordatis margine strigosis utrinque sparse strigosis demum nudis.—Dominica. Unknown to me.

After M. *tricephala*, p. 364, add:

M. *schrankioides*, sp. n.; aculeis uncinatis retrorsis numerosis, ramis striatis petiolisque hirsutis, stipulis subulatis, pinnis petiolo sæpius longioribus, foliolis 12-20-jugis oblongo-linearibus acutiusculis tenuiter marginatis ciliatis utrinque molliter adpresse villosis, bracteolis corolla subbrevioribus, calyce minuto longe ciliato, leguminibus dense setoso-hispidis. Rami adsunt elongati, striis aculeisque *Schranckiam* referentes. Petioli communes sesquipollicares, uti partiales aculeati. Foliola semipollicaria v. paullo longiora, præsertim subtus villosa. Pedunculi in racemum terminalum dispositi, ½-1-pollicares. Capitula parva. Bracteolæ longe ciliatæ. Corollæ tenues, vix lineam longæ. Stamina 4. Ovarium subsessile, villosulum. Legumina juniora setis densissime obtecta, sed formam nondum ostendunt.—British Guiana, *Schomburgk, 2nd. Coll.* n. 470 (765). Allied to M. *retrorsa*.

M. *pudica*, p. 367.—M. *striatostipula*, Steud. Flora, 1843, p. 758.—Java, *Zollinger*, n. 263; Surinam, *Hostmann*, n. 627; British Guiana, *Schomburgk, 2nd. Coll.* n. 508 (788). The latter is a slender form, smoother than usual and with smaller leaflets and pods, but not otherwise differing from the species which is very variable. It is probably this form that Martius designated as M. *Endymionis*.

M. *polydactyla*, p. 367.—M. *Glockeri*, Meisn. Pl. Glock. exs. n. 177.

M. *dispersa*, p. 369, is the same plant as M. *hirsuta*, Spr. Syst. 2, p. 204, which latter name must be substituted for mine. It was gathered by *Riedel* at Cujaba and Camapua.

M. *marginata*, p. 371.—Maldonado, Rio Plata, *Anderson*.

M. *hirsutissima*, p. 378, suffruticosa, inermis, caule erecto subsimplici setis patentibus hirsutissimo, pinnis unijugis subsessilibus, foliolis 15-25-jugis lineari-oblongis acutiusculis supra glabris subtus setosis, racemo terminali foliato, capitulis pedunculatis ovatis, bracteolis corolla subbrevioribus pilosissimis.—St. Paul, *Riedel* (Herb. Acad. Petrop.)

M. *subsericea*, p. 380, var minus setosa, pinnis brevioribus, St. Paul, *Riedel*.

Before M. *pogocephala*, p. 382, insert:

M. *eriophylla*, sp. n.; ramulis longe et dense lanatis, stipulis lato-lanceolatis, petiolo brevissimo, foliolis 10-15-jugis late falcato-oblongis acutiusculis utrinque adpresse villosis pilis subtus longis sublanatis, capitulis globosis villosissimis, bracteolis corollam æquantibus, calyce minuto v. obsoleto.—Affinis M. *pogocephalæ* sed lana densior, foliola majora (8-10 lin. longa, 3-4 lin. lata) crassiora, densius villosa, forma illa M. *dolentis* affiniumque referentia, sed non marginata et indumentum (etsi densius) *Eriocaulium*. Capitula racemosa; pedunculi breves, uti rhachis crassi, dense lanati. Bracteolæ longe ciliatæ.—Province of St. Paul, *Riedel*.

M. *Schomburgkii*, p. 390.—British Guiana, *Schomburgk, 2nd. Coll.* n. 313 (497).

After M. *interrupta*, add the eight following species:

M. *hebecarpa*, sp. n.; inermis?, ramulis petiolisque ferrugineo-pubescentibus, stipulis subulatis, pinnis 20-25-jugis, foliolis multijugis oblique oblongis parvis crassiusculis demum glabratis, spicis longis densis, rachide villosa, floribus tetrameris ovariisque hispidis, legumine lineari plano undique villoso inermi v. ad margines rarissime aculeolato.—Arbor biorgyalis et altior. Rami tortuosi, pube densa demum derasa. Folia in specimine juvenilia 3-pollicaria. Foliola adulta perpauca vidi, vix lineam longa. Spicæ crassæ 2-4-pollicares. Legumina formæ M. *acutistipulæ*, sed undique molliter villosa.—On the Rio Pardo, Brasil, *Riedel*.

M.? *millefoliata*, (Scheele, Linnæa 17, p. 337), ramis angulatis, pubescentibus aculeis sparsis compressis recurvatis, petiolis tomentosis aculeatis, glandula subulata ad basin petiolis, pinnis 12-15-jugis, foliolis 20-30-jugis imbricatis linearibus ciliatis, pedunculis tomentosis aculeatis, spicis cylindriceis elongatis folium æquantibus. — Minas Geraes, *Hartieben*. Unknown to me, the flowers are not described, the pod unknown, and no reference made to whose limitation of the genus the writer had in view, whilst the subulate gland is probably some mistake. It is a great misfortune that inexperienced botanists, deprived of the assistance of a good

library or herbarium, should by imperfect descriptions of species inundate the science with puzzles.

M. *fasciculata*, aculeis sparsis geminisve, ramulis petiolisque villoso-pubescentibus, stipulis linearibus, pinnis sub-15-jugis, foliolis 9-14-jugis dimidiato-oblongis utrinque pubescentibus, spicis cylindraceis densis, floribus 5-4-meris hirtis, ovario villoso.—*Acacia fasciculata*, Kunth. Mim. p. 75, t. 23.—Guanaxuato, *Humboldt* and *Bonpland*. Unknown to me.

M. *xantholasia*, sp. n.; inermis?, ramis petiolisque pubescentibus, stipulis anguste lanceolato-subulatis, pinnis sub-7-jugis, foliolis multijugis dimidiato-oblongis subfalcatis utrinque adpresse puberulis, spicis tenuibus laxiusculis, floribus tetrameris subglabris, ovario glabro. — Pubes ramulorum petiolorumque densa, flavescens. Spicæ fere M. *leiocarpæ*. Calyx membranaceus, laxus. Corolla late infundibuliformis, calyce triplo longior (1 lin. longa). Stamina corolla 3-4-plo longiora.—Venezuela, *Funcke*, n. 383.

M. *puberula*, sp. n.; inermis, pube minuta pallens, stipulis subulatis, pinnis 5-10-jugis, foliolis 15-20-jugis oblique oblongis crassiusculis pallidis, spicis cylindricis densis, floribus 4-5-meris glabriusculis, ovario pubescente.—Foliola rigidula 2-2½ lin. longa, 1 lin. lata. Spicæ subsesquipollicares, brevissime pedunculatæ. Flores membranacei. Corolla 1 lin. longa, late infundibuliformis. Stamina vix triplo longiora.—Zimapan in Mexico, *Coulter*.

M. *adenantheroides*, ramulis puberulis sulcato-striatis; aculeis sparsis validis uncinatis, pinnis sub-9-jugis, stipulis anguste lanceolato-subulatis, foliolis 8-10-jugis ovato-oblongis dimidiatis obtusiusculis utrinque puberulis subtus pallidis, spicis tenuibus laxiusculis, floribus puberulis 4-5-meris, ovario puberulo.—*Acacia adenantheroides*, Mart. et Gal. Bull. Acad. Bruss. 10, pars 2, p. 312. Ramuli insigniter sulcati. Foliola et pinnæ inter se distantia. Foliola 3-5 lin. longa, circa 2 lin. lata basi valde obliqua, discolora. Spicæ 1-1½ pollicares. Flores linea paullo longiores.—Mexico, *Galeotti*, n. 3208.

M. *remota*, sp. n.; undique pube minuta pallens v. candi-

cans, inermis?, pinnis 2-4-jugis remotis, stipulis anguste lanceolato-subulatis, foliolis 5-7-jugis oblique ovatis oblongisve obtusiusculis utrinque puberulis concoloribus, spicis tenuibus laxis, floribus 4-5-meris ovariisque puberulis. Affinis M. *adenantheroidi*, sed aculei in specimine nulli, pinnæ et foliola pauciora et hæc utrinque nec subtus tantum candicantia.—Mexico, *Galeotti*, n. 3240.

M. *guatemalensis*, (Benth. Bot. Sulph. p. 89), undique molliter villosa, aculeis sparsis rectis v. vix uncinatis, pinnis 3-4-jugis, stipulis lanceolatis angustis, foliis 3-6-jugis oblique ovali-oblongis supra breviter subtus longe villosis, spicis cylindricis densis, floribus pentameris villosis, ovario puberulo.—Ramuli, petioli, foliola, spicæ, omnia pube ferrugineo-flavicante vestita, pilis in pagina inferiore foliolorum longioribus appressis. Foliola 6-10 lin. longa, 2-4 lin. lata. Spicæ pollicares v. paullo longiores, longiuscule pedunculatæ, Flores lineam longi, calyce amplo dimidium corollæ superante. Bracteolæ vix flore breviores. Stamina 10 (nec sub-20).—*Inga guatemalensis*, Hook. et Arn. Bot. Beech. p. 419.—Realejo, *Sinclair*; Tepic, *Barclay, Coulter*.

Before M. *obovata*, p. 394, insert:

M. *leucænoides*, n. sp.; inermis, ramulis petiolisque minute ferrugineo-puberulis, stipulis minutis, pinnis unijugis, foliolis 2-4-jugis obovatis subrhombeisve obtusissimis glabris v. minute puberulis coriaceis venosis nitidis, capitulis axillaribus pedunculatis globosis, floribus tetrameris, legumine lineari minute puberulo v. glabrato nitidulo.—Foliola magnitudine varia, maxima pollicem longa et lata, pleraque tamen minora et proportione angustiora. Capitula iis M. *Ceratoniæ* paullo majora, flores cæterum subsimiles. Legumen 2-2½ poll. longum, leviter incurvum, 3 lin. latum.—Zimapan in Mexico, *Coulter*.

M. *obovata*, p. 394.—Frutex scandens, floribus albis, in maritimis Bahia, *Lushnath*.

M. *sepiaria*, p. 395.—Bahia, *Glocker*, n. 158.

After M. *oligacantha*, p. 395, add:

M. *detinens*, sp. n.; fruticosa, ramosissima, glabra v. canes-

cens, glaucescens, aculeis uncinatis sparsis, pinnis unijugis, foliolis 4-6-jugis oblique oblongis obtusis parvis glaucis, capitulis globosis axillaribus pedunculatis, bracteolis parvis, floribus tetrameris, legumine glabro stipitato nudo.—Ramuli et folia pube minutissima sub lente vix conspicua glaucescentia v. glabrata. Stipulæ obsoletæ. Folia fere M. *depauperatæ*; pinna vix 4 lin., foliola vix 2 lin. longa. Legumina glaucescentia, glabra, 1-2 poll. longa, 4-5 lin. lata. Flores fere *Acanthocarparum*. Stamina nonnulla sæpe abortiunt, et raro omnia 8 perfecte antherifera.—True *Agorrovato* or *Grip-the-goat*, a name given to most spring plants in Cordova and St. Jago, but the spines of this being most hooked, hold the best. *Tweedie*, n. 1251.

M. *rubicaulis*, p. 395.—Affghanistan, *Griffith*, n. 1188.

M. *asperata*, p. 400.—Bahia, *Glocker*, n. 178, this is the very hispid form, one of the commonest in South America and correctly determined to be the M. *pellita*, Kunth., though not distinguishable as a species.

M. *microcephala*, p. 401.—British Guiana, *Schomburgk*, *2nd. Coll.* n. 524 (814).

M. *camporum*, p. 403, grows also in Surinam (Miquel). After which add the three following:

M. *flaviseta*, (sp. n.), decumbens ?, aculeis tenuissimis raris, caule petiolisque setis longis patentibus hispidis, stipulis lanceolato-setaceis, pinnis 3-4-jugis, foliolis 10-30-jugis oblongis longe setoso-ciliatis glabriusculis, capitulis ovatis breviter pedunculis setoso-hispidissimis, bracteolis corollas superantibus, calyce minuto.—Affinis M. *camporum*, sed setis longis flavidis crebris insignis, quarum nonnullæ hinc inde validiores fere aculeiformes; foliola etiam breviora, proportione latiora, capitula majora, longius pedunculata et multo hispidiora. Legumen junius densissime setosus.—Surinam, *Hostmann*, n. 813.

M. *æschynomenis*, (Benth. Bot. Sulph. p. 89), herbacea ?, procumbens, inermis, caule petiolisque setoso-hispidis, stipulis ovato-cordatis lanceolatisve acuminatis, pinnis 3-6-jugis, foliolis 10-30-jugis oblongo-linearibus ciliatis glabriusculis,

capitulis parvis brevissime pedunculatis, bracteolis lanceolatis corollam superantibus, legumen oblongo 1-2-articulato vix obliquo undique setoso.—Hæc etiam affinis est M. *camporum*, sed hispidior, omnino inermis, stipulæ latiores, bracteæ longiores.—Realejo, *Hinds*, *Sinclair*.

M. *pusilla*, (Benth. Bot. Sulph. p. 90), herbacea, annua, inermis, caule petiolisque hispidis, stipulis ovatis acutiusculis, pinnis 1-3-jugis, foliolis 6-15-jugis oblongis ciliatis, capitulis breviter pedunculatis parvis paucifloris, bracteolis lato-lanceolatis ciliatis corollas æquantibus, legumine oblongo 1-2-articulato vix obliquo undique setoso.—Caules tenues graciles 4-6-pollicares. Capitula dimidio fere minora et tota planta minus hispida quam in M. *æschynominis*.—Realejo, *Hinds*.

After M. *antrorsa*, p. 403, add:

M. *adenotricha*, sp. n., suffruticosa, ramis teretibus, petiolisque pilis glanduliferis et pube breviore hirsutis, aculeis sparsis parvis antrorsum uncinatis, pinnis 6-8-jugis, foliolis 10-15-jugis parvis oblongis subtus margineque hispidis, racemo terminali, capitulis globosis, bracteolis corollam æquantibus, calyce parvo ciliato, legumine oblongo undique adpresse et rigide hispido.—Species cum M. *antrorsa* convenit aculeis sursum nec deorsum uncinatis et habitus subsimilis, sed indumento, numero pinnarum et foliolorum, etc., abunde differt. Legumen (quod non nisi junius vidi) multo brevius videtur, fere *Pachycarpium*.—Serra da Lapa, Brasil, *Riedel*.

After M. *setosa*, p. 404, add:

M. *Riedeli*, sp. n.; setis raris pubeque brevi rigida asperrima, pinnis 15-20-jugis, foliolis oblique ovatis oblongisve ciliatis glabriusculis coriaceis, racemo elongato polycephalo ramoso, capitulis hispidis pedunculatis, bracteolis corollas subæquantibus, calyce minuto longe ciliato.—Frutex 2-3-pedalis. Stipulæ latæ. Setæ v. hirsuties in inflorescentia longiusculæ creberrimæ flavidæ, in petiolis breviores rigidiores, in caule demum ad scabritiem reductæ. Folia 8-9-pollicaria. Foliola 2 lin. longa, arcte approximata, rigida, siccitate nigricantia. Panicula seu racemus ultrapedalis,

aphyllus, oblongo-pyramidatus, capitulis numerosis quam in affinibus paullo minoribus.—Serra da Chapada, Brasil, *Riedel.*

After M. *pachycarpa*, p. 406, or perhaps next to M. *mollis*, p. 408, add:

M. *Galeottii*, fruticosa, ramulis petiolisque setoso-hispidissimis, aculeis caulinis infrastipularibus geminis recurvis petiolaribus nullis v. raris sparsis, pinnis 15-25-jugis, foliolis 15-20-jugis minimis glabris ciliatis, pedunculis axillaribus folio brevioribus, capitulis ellipticis, bracteolis minutis, floribus 4-5-meris, calycibus corolla dimidio brevioribus, legumine lato-lineari glanduloso-puberulo suturis aculeato-setosis valvulis subnudis integris.—*Acacia hirta*, Mart. et Gal. Bull. Acad. Bruss. 10, pars. 2, p. 318.—Folia et setæ *Pachycarparum*, cœterum M. *acanthocarpæ* affinis.—Mexico, *Galeotti*, n. 3165.

M. *lucidula*, p. 407.—M. *Kermesina*, Otto et Dietr.—Walp. Rep. 1, p. 883.

After M. *quitensis*, p. 408, add:

M. *acantholoba* (Benth. Bot. Sulph. p. 90), fruticosa, ramulis puberulis, aculeis sparsis recurvis, stipulis setaceis, pinnis 4-10-jugis, foliolis 15-30-jugis oblongo-linearibus subtus pubescentibus, pedunculis axillaribus folio brevioribus superioribus racemosis, capitulis globosis, bracteis minutis, floribus 4-5-meris, calycibus corolla quadruplo brevioribus, ovario villoso, legumine membranaceo oblongo vel late lineari-falcato puberulo margine leviter aculeato.—*Acacia acantholoba*, Humb. et Bonpl. in Willd. Spec. 4, p. 1089.—Guayaquil, *Humboldt* and *Bonpland*, *Hinds*.

After M. *biuncifera*, p. 409, add:

M. *tenuiflora*, sp. n.; glabra, aculeis caulinis infrastipularibus geminis recurvis parvis, petiolaribus sparsis minutis v. nullis, stipulis setaceis, pinnis 1-3-jugis, foliolis 6-8-jugis oblique oblongis, pedunculis folio sublongioribus superioribus racemosis, capitulis globosis, bracteis minutis, floribus 4-5-meris, corolla calyce 4-plo longiore.—Habitu M. *depauperatæ* subsimilis. Capitula numerosa. Flores ab affinibus differunt

calyce minuto, corolla tenui fere $1\frac{1}{2}$ lin. longa.—Zimapan in Mexico, *Coulter*.

M. *depauperata*, p. 410.—*Acacia canescens*, Mart. Gal. in Bull. Acad. Bruss. 10, pars 2, p. 314.—Mexico, *Galeotti*, n. 3214.

M. *polyantha*, p. 410.—Either the same species or one closely allied to, it was gathered by *Coulter* with the *Prosopis pubescens* between San Miguel and Monterey in California. After this add:

M. *laxiflora*, sp. n.; glabra, pallescens, aculeis sparsis recurvis raris, stipulis minutis setaceis, pinnis remotis 2-3-jugis, foliolis remotis 3-6-jugis oblique oblongis, spicis laxis cylindricis, floribus breviter pedicellatis glabris 4-meris, calyce corolla tri-quadruplo breviore.—Affinis videtur hinc M. *remotæ* inter *Rubicaulibus*, hinc M. *polyanthæ* inter *Acanthocarpis*, et fructu ignoto locus incertus. Ramuli graciles. Petioli communes tenues, 5-3-pollicares. Foliola parva, pauca. Spicæ brevissime pedunculatæ, pollicares v. paullo longiores.—Sonora alta, Mexico, *Coulter*.

To the *Mimosæ* unknown to me, must be added M. *arcuata*, Mart. et Gal. from Mexico; M. *dominiciana*, Desv. from Dominica.

Of the *Species dubiæ addendæ* of Walpers, Repert 1, p. 882. M. *glaberrima* is my *Albizzia glaberrima*; M. *adianthifolia*, Schum, must be a *Zygia* and M. *guinensis* an *Albizzia*; M. *pentagona* is scarcely sufficiently known to determine the genus; M. *procumbens*, Schum. has been referred in a former part of this paper to M. *asperata*, M. *bicolor*, Schum. to *Dichrostachys nutans* and M. *adstringens*, Schum. to *Acacia Adansoni*; M. *pumila*, Schlecht. is, as above suggested, probably a *Desmanthus*; M. *Kermesina* is my M. *lucidula*; M. *meticulosa*, Mart. is included among the true *Mimosæ*; M. *adhærens* referred to *Acacia adhærens* and M. *acacioides* Benth. to *Piptadenia peregrina*, so that a very little attention on the part of the compiler might have reduced considerably these "Species dubiæ." Lastly M. *monilifera*, Bertol. is probably M. *floribunda*.

Schranckia, *Hook. Journ.* 4, p. 413.

After S. *rhodostachya*, p. 414, add:

S. *glabra*, sp. n.; ramulis angulatis foliisque glabris, pinnis 8 10-jugis, foliolis multijugis linearibus glabris margine subciliatis, spicarum rhachidibus puberulis.—Aculei numerosi, uncinati. Petioli communes 2-3-pollicares; pinnæ 1½-2 poll. foliola 2-3 lin. longa, venis inconspicuis. Stipellæ minutæ. Setæ inter pinnas obsoletæ. Spicæ pedunculatæ, laxæ, 1-1½-pollicares. Flores glabriusculi, breviter pedicellate. Bracteolæ parvæ. Calyx vix ¼ lin. longus. Corolla linea paullo longior. Stamina corolla 4-5-plo longiora.—New Granada, *Linden*, n. 1501.

S. *brachycarpa*, p. 415.—Rio Negro, *Schomburgk*, 1*st Coll.* n. 903; Mexico, *Galeotti*, n. 3328; Zacuapan, *Linden*.

S. *leptocarpa*, p. 415.—Rio Negro and British Guiana, *Schomburgk*, 1*st Coll.* n. 931; *2nd Coll.* n. 380 (645), as well as I could judge from the fragments I received; Bahia, *Glocker*, n. 154.

S. *elata*, Mart. et Gal. Bull. Acad. Bruss. 10, pars 2, p. 309, (Mexico, *Galeotti*, n. 3193) is unknown to me.

Leucæna, *Hook. Journ.* 4, *p.* 416.

L. *glauca*, p. 416.—Java, *Zollinger*, n. 175; Bahia, *Glocker*, n. 169.

L. *diversifolia*, p. 417.—*Acacia esculenta*, Mart. et Gal. Bull. Acad. Bruss. 10, pars 2, p. 314 non DC.—Mexico, *Galeotti*, n. 3226. After which add:

L. *Forsteri*, pinnis 12-51-jugis, foliolis multijugis oblongolinearibus approximatis obliquis, calyce petalis paullo breviore, antheris glabris.—*Mimosa glandulosa*, Forst. Prod.—*Acacia insularum*, Guillem. Ann. Sc. Nat. Par. Ser. 2, v. 7, p. 360. —*Taiti.*

After L. *trichodes*, p. 417, add the two following:

L. *canescens* (Benth. Pl. Hartw. p. 117), tota pube brevi canescens, pinnis 1 2-jugis, foliolis 2-3-jugis oblique ovatis

obtusis amplis, pedunculis confertis axillaribus racemosisve capitulo longioribus.—Guayaquil, *Hartweg*, n. 655.

L. *macrophylla* (Benth. Bot. Sulph. p. 90), glabra, pinnis 2-3-jugis, foliolis 2-4-jugis ovato-acuminatis acutis amplis, pedunculis capitulo subbrevioribus fasciculatis in racemos axillares terminalesque dispositis.—Acapulco, *Hinds.*

Acacia, *Lond. Journ. v.* 1, *p.* 318 *to* 392 *and* 494 *to* 528.

In the Plantæ Preissianæ sixteen new species belonging to the *Phyllodineæ* and two to the *Pulchellæ* are described by Meissner, who has also added many important observations and descriptions to species already known of those two divisions; but as that work is indispensable for the study of South-West Australian plants, it is unnecessary to insert these species here. Besides these, A. *rotundifolia*, Hook. Bot. Mag. t. 4041 is closely allied to A. *undulæfolia*, p. 346; A. *erythropus*, Ten. Walp. Rep. 2, p. 906 is probably A. *dentifera*, p. 363, A. *uniglandulosa*, Seem. et Schm. Flora 1844, p. 495 is A. *platyptera*, p. 324, and amongst the *Botrycephala*, A. *chrysobotrys*, Meissn. Walp. Rep. 2, p. 906, is said to be near A. *spectabilis*, p. 383 and A. *Sieberiana*, Scheele Linnæa 17, p. 337 is probably a variety of A. *discolor*, p. 384.

A. *tortuosa*, p. 392.—To this very variable species may be added the following synonyms and stations, *Mimosa salinarum*, v. Rohr. with the station Jamaica " ad salinas," but not agreeing with Vahl's description; Gallipagos Islands, *Darwin*, *Scouler*. The M. *tortuosa* of Jacquin appears to be the A. *Farnesiana*.

A. *Farnesiana*, p. 494, amongst the numbered collections may be quoted Brasil, *Martius*, n. 1099, *Gardner*, n. 977; Surinam, *Hostmann*, n. 353; Texas, *Berlandier*, n. 1369, 1466; Java, *Zollinger*, n. 725, etc.

A. *Cavenia*, p. 495.—Mexico, *Coulter*; Gallipagos, *Darwin*. A. *adenopa*, Hook. et Arn.? Bot. Misc. 3, p. 206.

A. *hebeclada*, p. 499.—Vaal River and Aapges River,

(Macalisberg) *Burke.*—Legumen 3 poll. longum, 1 poll. latum, crassissimum coriaceum extus flavo tomentosum et oblique striatum, intus pulpa cellulosa demum evanescente cavum.

A. *arabica*, p. 500, *β Kraussiana*, Macalisberg, *Burke;* *δ. indica.*—Affghanistan, *Griffith*, n. 1189, 1190.

A. *robusta*, p. 501.—Rhinoster Kop and Macalisberg, *Burke.*—Legumen 3 poll. longum, fere pollicem latum, rectum v. leviter falcatum, planum, demum convexum, coriaceum, glabrum, rete venarum a medio ad latera obliquarum notatum, basi in stipitem brevem angustatum. An huc A. *Natalitia*, E. Mey.? After this add the three following species:

A. *pterygocarpa*, (Hochst. in Schimp. Pl. Abyss. exs. Sect. 2. n. 1036), ramulis petiolisque albido-flavicantibus pilosulis, spinis subulato-conicis rectis v. leviter recurvis, glandulis parvis paucis, pinnis 3-4-jugis, foliolis 8-12-jugis oblongo-linearibus obtusis pallidis glabris, pedunculis tomentosis versus medium bracteatis, legumine rectiusculo latolineari pubescente valvulis tenuiter coriaceis medio convexis oblique lineatis margine tenuibus.—Primo intuitu A. *nubicam* refert, sed foliola et pinnæ pauciora et pubes rarior. Legumen 2½ poll. longum, 6 lin. latum, basi in stipitem brevem latum angustatum.—Abyssinia, *Schimper.*

A. *xiphocarpa* (Hochst. Pl. Schimp. exs. Sect. 2, n. 522), ramulis sulcatis petiolisque dilatatis rubentibus glabris v. minute puberulis, spinis parvis conicis subrecurvis nunc obsoletis, pinnis 15-30-jugis, glandulis parvis foliolis, 20-40-jugis linearibus glabriusculis, pedunculis puberulis infra medium bracteatis, floribus glabris, legumine lato, lineari subfalcato plano-convexo oblique lineato scabriusculo.—Habitus et inflorescentia A. *horridæ* et A. *robustæ*, pinnis foliolisque numerosis facile distincta. Folia in specimine compacto fructifero (A. *xiphocarpa*, Hochst.), vix 3 poll. longa, pinnis 9 lin. foliolis 1 lin. longis, in ramo vegetiore florifero (A. *amythethophylla*, Hochst. Pl. Schimp. Sect. 2, n. 887), ad eandem speciem meo sensu pertinente, 8-9 poll. longa

pinnis 1-3 poll. foliolis 2-3 lin. longis. Legumen fere A. *robustæ.*—Abyssinia, *Schimper.*

A. *abyssinica,* (Hochst. Pl. Schimp. exs. Sect. 3, n. 1813), ramulis petiolisque molliter villosis, spinis brevibus conicis tomentosis, pinnis 6-15-jugis, glandulis scutellæformibus, foliolis 20-30-jugis linearibus ciliato-puberulis, pedunculis pubescentibus supra basin bracteatis capitulo paullo longioribus.—Habitu A. *tomentosæ* similis, sed foliola numerosiora et pedunculi breviores et huc pertinere videntur specimina fructifera *Ingæ Nefasiæ,* Hochst. Pl. Schimp. Sect. 2, n. 940, quibus legumen fere A. *xiphocarpæ* sed rectius et crassius.—Abyssinia, *Schimper.* No. 382 of the 1st Section referred to this plant by Hochstetter belongs to a very different species, at least in Sir W. Hooker's set, and is either A. *gummifera* or a species very nearly allied to it.

A. *Seyal.* p. 501.—A. *Raddiana,* Savi. Arch. Bot. 1, p. 373, —var villosior, leguminibus puberulis demum crassioribus. —A. *spirocarpa,* Hochst. Pl. Schimp. exs. Sect. 2, n. 502 et 612.—Abyssinia, *Schimper.*

A. *horrida,* p. 502.—A. *capensis,* Burch. Trav. 1, p. 189, Colla Mem. Tor. 35, p. 175.

A. *Natalitia,* p. 502.—Port Natal, *Krauss,* n. 66.—This is probably the same species as A. *robusta,* Burch., which being the older name should be adopted. When in flower it is difficult to distinguish the specimens from those of A. *horrida,* but the broad pod is very different. It appears to remain flat till ripe when it becomes thick and convex as in Drège's specimens of A. *clavigera,* E. Mey.

A. *Hindsii,* p. 504.—Mexico, *Jurgensen,* n. 169.

A. *albida,* p. 505.—A. *gyrocarpa,* Hochst. Pl. Schimp. Abyss. exs. Sect. 2, n. 1333 is this species with the pod curved into a complete spire.

After A. *detinens,* p. 508, add the two following species:

A. *ferox,* sp. n., ramulis junioribus petiolisque villosis, aculeis geminis ternisve, infrastipularibus recurvis, infrafoliaceo minore v. nullo, petiolo aculeato, glandulis minutis, pinnis 4-6-jugis, foliolis 3-6-jugis oblique obovato-oblongis

obtusissimis, capitulis subglobosis brevissime pedunculatis, legumine oblongo v. lato-lineari membranaceo oligospermo. —Macalisberg, *Burke*.

A. *Burkei*, (sp. n.); ramulis junioribus petiolisque villosis, aculeis infrastipularibus geminis recurvis, petiolo inermi, pinnis 3-6-jugis, foliolis 5-8-jugis oblique oblongis obtusiusculis, spicis fasciculatis laxis folio sublongioribus, calycibus subsessilibus puberulis dentato-lobatis corollæ dimidium æquantibus, legumine membranaceo?—Macalisberg, *Burke*.

A. *modesta*, p. 508.—Affghanistan, *Griffith*, n. 1186, and apparently 1187.

After A. *læta*, p. 508, add:

A. *venosa*, (Hochst. Pl. Schimp. exs. Sect. 2, n. 524), glabra, pallida v. glauca, aculeis infrastipularibus geminis minutis raris v. nullis, petiolo inermi, pinnis 4-5-jugis, foliolis 6-8-jugis oblique oblongis obtusiusculis, spicis axillaribus (laxis?) legumine longe et late lineari membranaceo glabro.—Similis A. *lætæ*, sed pinnæ et foliola numerosiora, hæc 3-4 lin. longa et legumen (fere *Albizziæ*) semipedale, pollicem latum.—Abyssinia, *Schimper*.

The specimens n. 898 of Schimper's second section, without flowers or fruit, appear to belong to some *Acacia* allied to A. *lenticularis*.

A. *Catechu*, p. 510.—I am unable to distinguish from this species the A. *erythrantha*, Steud. in Schimp. Pl. Abyss. exs. Sect. 2, n. 1120, A. *hecatophylla*, Steud. l. c. Sect. 2, n. 884, and A. *campylacantha*, Hochst. l. c. n. 639 and 893, all from Abyssinia.

A. *caffra*, p. 509, which can scarcely be distinguished from A. *Catechu*, but by the narrower pod, was gathered in several places about Macalisberg by *Burke*.

After A. *ataxacantha*, p. 511, add:

A. *eriadenia*, (sp. n.), aculeis sparsis rectis recurvisque raris, ramulis petiolisque tomentoso-villosis, stipulis membranaceis semicordatis acuminatis villosis, pinnis 6-10-jugis, glandulis petiolaribus 1-2 jugalibusque paucis elevato-conicis, villosis, foliolis circa 20-jugis oblique linearibus utrinque

adpresse pilosulis, spicis elongatis laxiusculis supremis racemosis, floribus subsessilibus glabris, calyce corolla dimidio breviore.—Crocodile River, (Macalisberg), *Burke.*

A. *Acatlensis*, p. 513.—Zimapan, *Coulter*, after which add:

A. *sericea*, (Mart. Gal. in Bull. Acad. Bruss. 10, pars. 2, p. 311), arborea, canescenti-villosa, stipulis setaceis rigidis subpungentibus, caule cœterum inermi, petioli glandulis cupuliformibus, pinnis 3-6-jugis, foliolis multijugis linearibus acutiusculis utrinque canescenti-villosis, spicis axillaribus elongatis densis fasciculatis subracemosisque, floribus sessilibus villosis, calyce corolla parum breviore.—Mexico, *Galeotti*, n. 3345.

A. *pennata*, p. 516. To the synonyms of this species must be added A. *amblyocarpa*, Wall. Cat. n. 5260.

A. *Claussenii*, p. 518. Gardner's number should be 1281, not 1821.

A. *paniculata*, p. 519.—Schomburgk's specimens, 2nd Coll. n. 299 (586) belong to the same species as the St. Lucia specimen I had considered as probably the A. *paniculata* of Willd., and distinguished from A. *Martii*, of which it has the foliage, by the much smaller heads of flowers. The species, however, of this group run so much into one another that it is very difficult to determine them without good specimens in flower and fruit.

A. *Westiana*, 520.—British Guiana, *Schomburgk*, *2nd. Coll.* n. 495 (768).

A. *polyphylla*, p. 520.—British Guiana, *Schomburgk*, *2nd Coll.* n. 493 (763).

A. *striata*, p. 521.—Bogota, *Hartweg*, n. 963.

A. *hirsuta*, p. 524.—A. *elegans*, Mart. Gall. Bull. Acad. Bruss. 10, pars. 2, p. 312.—Mexico, *Galeotti*, n. 3203.—A. *elegans*, Schlecht. Linnæa, 12, p. 569, appears to be nearer A. *glabrata*.

A. *glabrata*, p. 525.—A. *insignis*, Mart. Gal. l. c. p. 315, Mexico, Galeotti, n. 3303 appears to be this species.

A. *cuspidata*, p. 525.—Specimens in *Coulter's* Mexican

collection, with glandular dots scattered on some of the petioles (not the ordinary petiolar glands) belong probably to Schlechtendahl's species, which is scarcely distinct from A. *glabrata*.

Amongst the "Species a Benthamio omnino neglectæ," enumerated by Walpers Rep. 1, p. 922, are included the following, which a little attention would have enabled him to find in the papers copied by him.

A. *uncinata*, under A. *undulæfolia*, Lond. Journ. 1, p. 346.

A. *prominens*, Lond. Journ. 1, p. 357.

A. *insularum*, referred to *Leucæna*, Lond. Journ. 1, p. 527.

A. *pentadenia*, Lond. Journ. 1, p. 386.

A. *acutistipula*, under *Mimosa acutistipula*, Hook. Journ. 4, p. 391.

A. *filicoma*, under *Piptadenia filicoma*, Hook. Journ. 4, p. 336.

A. *Campbelli* is only given by Arnott as a variety of A. *Roxburghii*, Lond. Journ. 1, p. 498.

A. *furcata*, Lond. Journ. 1, p. 523.

A. *stipellata*, under A. *umbellulifera*, Lond. Journ. 1, p. 524.

Of those which had escaped me, or were published after my papers were written, A. *semiverticillata* is probably the same as A. *verticillata*, A. *spathulata*, Tausch is A. *longifolia*, A. *capensis*, Colla, is A. *horrida*, A. *Raddiana* does not appear to differ from A. *Seyal*, A. *adenopa*, Hook. et Arn., (not *adenocarpa*), is probably A. *Cavenia*, and the remainder are not sufficiently described to enable me to form any opinion respecting their affinities.

Of the *Acaciæ* described by Martius and Galeotti, A. *sericea* is inserted above, A. *gracilis* is *Calliandra formosa*, A. *elegans*, is A. *hirsuta*, A. *adenantheroides* is *Mimosa adenantheroides*, A. *cylindriflora*, A. *ferox*, A. *mollicula*, and A. *lanata*, are unknown to me, A. *canescens* is *Mimosa depauperata*, A. *insignis* is A. *glabrata*, A. *rubescens* is *Calliandra*, *xalapensis*, A. *media* is *Calliandra angelica*, A. *obliquifolia* is *Pithecolobium dulce* and A. *hirta* is *Mimosa Galleottii*.

Four additional *Acaciæ* are inserted in the 2nd vol. of Walp. Rep. p. 906. Of these A. *rotundifolia* is above mentioned as close to A. *undulata*. A. *leucophylla* will be found quoted under A. *pendula*, Lond. Journ. 1, p. 336. A. *erythropus* is probably A. *dentifera*, A. *chrysobotrys* must be placed next to A. *spectabilis*.

A. *rufa*, Hassk. Hort. Bog. p. 290, is *Albizzia rufa*, described below.

A. *paniculiflora*, Steud. Flora, 1843, p. 760, is my *Entada? myriadenia*.

ALBIZZIA, *Lond. Journ. v. 3, p.* 84 *to* 92.

A. *ferruginea*, p. 88. The specimens of *Acacia malacophylla* of the 3rd Sect. n. 1578, of Schimper's Abyssinian plants differ from the Senegalese in the whiter down of the foliage, and the petiolar gland small, or entirely deficient, but yet they appear to belong to the same species. After this species add:

A. *rufa*, ramulis petiolisque junioribus paniculaque rufo-tomentosis, foliis aculeo recurvo crassiusculo suffultis, pinnis 4-6-jugis, foliolis 8-12-jugis oblongis v. obovato-oblongis obtusis mucronulatis inæquilateris, panicula floribunda, capitulis parvis multifloris, floribus sessilibus villosis, calyce corollo pluries breviore, ovario villoso, "leguminibus planis? membranaceis."—*Acacia rufa*, Hassk. Hort. Bogor. p. 290. —Foliola 6-8 lin. longa, juniora pilis mollibus appressis sericea, demum glabriora. Panicula insigniter rubido-tomentosa v. villosa. Corolla 1½ lin. longæ. Aculeus infrafoliaceus recurvus singularis est, vix pungens, an ex stipulis 2 conflatus?—Java, *Zollinger*, n. 80.

ZYGIA, *Lond. Journ. v. 3, p.* 92.

Mimosa adianthifolia, Schum. Beskr. Fl. Guin. p. 322, belongs evidently to this genus.

CALLIANDRA, *Lond. Journ v. 3, p.* 93 to 112.

C. *amazonica*, p. 94.—*Inga bauhiniæfolia*, Pœpp. et Endl. Nov. Gen. et Sp. v. 3, p. 80, t. 290.

C. *falcata*, p. 97.—Venezuela, *Funcke*, n. 370, and probably not from Mexico, the leaves vary much in size, and are very irregular in shape, but usually more or less ovate or rhomboidal and oblique, or falcate.

C. *formosa*, p. 98.—*Acacia gracilis*, Mart. Gal. Bull. Acad. Bruss. 10 pars. 2, p. 311.

C. *tetragona*, p. 99.—Mexico, *Jurgensen*, n. 792.

C. *portoricensis*, p. 99.—Venezuela, *Funcke*, n. 380; British Guiana, *Schomburgk*, *2nd Coll.* n. 820 (1513); Zimapan, and near the town of Mexico, *Coulter*.—After which add:

C. *pallens*, (sp. n.); ramulis foliisque pube molli pallidis, stipulis parvis rigidis subspinescentibus, pinnis 4-6-jugis, glandulis petiolaribus 1-2 scutellæformibus parvis v. nullis, foliolis 12-20-jugis oblique oblongo-linearibus utrinque pubescentibus, pedunculis pubescentibus petiolo communi multo brevioribus superioribus paniculatis, floribus glabriusculis, calyce 5-dentato corolla 4-plo breviore, legumine glabriusculo valvulis coriaceis marginibus incrassatis.—Species quodammodo C. *angelicæ* affinis sed characteribus datis ab omnibus abunde distincta. Foliola 2-4 lin. longa, linea paullo latiora. Legumen 4-5 poll. longum, semipollicem latum, pube rara conspersum v. demum glabratum, acumine recto terminatum, basi in stipitem brevem angustatum.—Zimapan, *Coulter*.

C. *angelica*, p. 100.—*Acacia media*, Mart. Gal. Bull. Acad, Bruss. 10, pars. 2, p. 316.

C. *taxifolia*, p. 104.—Ravines near Ona, in the Andes of Quito, *Jameson*.—After this add:

C. *Magdalenæ*, petiolis pubescentibus, stipulis lato-lanceolatis, pinnis unijugis, foliolis multijugis oblongo-linearibus falcatis obtusis glabris, pedunculis petiolo brevi paullo longioribus, floribus sessilibus glabris, calyce irregulariter dentato corolla 3-4-plo breviore, "legumine crassiusculo glabro, valvulis crassis extus sulcatis."—*Acacia Magdalenæ*, Bert. in DC. Prod. 2, p. 455.—Valde affinis, C. *brevipedi*, (potius quam C. *squarrosæ*) sed major; stipulæ pleræque 2 lin. longæ; pinnæ 1½-2-pollicares; foliola nitida, reticulata, pleraque 4 lin. longa. Capitula et flores fere C. *brevipedis*.—A showy

shrub at the beginning of the season, common on the coast near Santa Martha, *Purdie*.

Before C. *eriophylla*, p. 105, insert the two following:

C. *rigida*, (sp. n.), ramulis rufo-villosis, stipulis ovatis acutis striatis, petiolo pilosulo, pinnis sub-2-jugis, foliolis multijugis oblique linearibus obtusis rigidis glabris subtus glaucescentibus, pedunculis axillaribus petiolo communi longioribus, legumine minute puberulo, valvulis coriaceo-lignosis incrassato-marginatis. — Petioli communes 3-6 lin. longi. Foliola 4-5 lin. longa (ultimis brevioribus), fere *Abietis*, regulariter disticha, approximata, marginibus (in sicco) recurvis. Legumen 4-pollicare, basi longe angustatum. — British Guiana, *Schomburgk*, a single specimen from the last expedition.

C. *linearis*, (sp. n.); humilis, cœspitosa, glabra, pinnis 2-jugis, stipulis setaceis caducis, foliolis 8-12-jugis anguste linearibus coriaceis nitidulis, pedunculis folio brevioribus, floribus sessilibus glabris, calyce corolla 4-plo breviore.—Species insignis foliolis 4-6 lin. longis et vix semilineam latis.—Serra da Lapa, Brasil, *Riedel*.

C. *Cumingii*, p. 106.—New Granada, *Linden*, n. 696.

Var. β. *Galeotti* —*Inga speciosa*, Mart. Gal. Bull. Acad. Bruss. 10, pars. 2, p. 320. After this add:

C. *humilis*, (sp. n.); undique pilosa v. rarius glabriuscula, stipulis lanceolatis acutiusculis, pinnis distantibus 4-6-jugis, foliolis 8-10-jugis breviter oblongo-linearibus obtusis, pedunculis petiolo communi multo brevioribus, calycibus pilosis dimidio corollæ paullo brevioribus, legumine hirsuto valvulis crassiusculis.—Suffrutex diffuse ramosus, vix unquam semipedalis, nunc pilis laxiusculis copiosis canescens, nunc fere glaber. Petiolus communis tenuis, 1½-3-pollicaris, pinnæ vix semipollicares, foliola lineam longa. Corollæ 3 lin. longæ.—Zacatecas, *Coulter*.

C. *xalapensis*, p. 106.—*Acacia rubescens*, Mart. Gal. Bull. Acad. Bruss. 10, pars. 2, p. 315.

C. *Tweedii*, p. 107.—Bot. Mag. t. 4188.

After C. *stipulacea*, p. 107, add the two following:

C. *comosa.—Inga comosa*, Willd. Spec. 4, p. 1026.—*Pithecolobium ? comosum*, Benth. Lond. Journ. 3, p. 221.

C. *bracteosa*, (sp. n.); ramulis petiolisque glabris v. rariter pilosulis stipulis lanceolatis foliaceis rigidis, pinnis subbijugis, foliolis multijugis, subfalcato, linearibus obtusiusculis supra nitidis glabris, pedunculis petiolo brevi duplo longioribus, bracteis exterioribus amplis foliaceis lanceolatis, calycibus 5-fidis glabris corolla glabra paullo brevioribus.—C. *fasciculatæ* subsimilis, sed petioli communes multo breviores, pedunculi sublongiores, stipulæ multo majores et capitula bracteis 4-6 lin. longis latis striatis ciliatis involucrata. Calyces etiam multo magis quam in affinibus evoluti.—Diamond district, prov. Minas Geraes, *Gardner*, n. 4523 and 4524.

C. *fasciculata*, p. 108.—Serra da Lapa, and in various parts of the Diamond district, *Riedel.*

C. *Gardneri*, p. 108.—Legumen 4 poll. longum, 6 lin. latum, minute pubescens, marginibus valde incrassatis.

C. *abbreviata*, p. 108.—Gardneri, n. 2835, from Rio Preto is probably this species.

C. *macrocephala*, p. 108.—Techada, and prov. St. Paul, *Riedel.*

C. *dysantha*, p. 109.—Province of Goyaz, *Gardner*, n. 3702 and 4124.

C. *viscidula*, p. 109, var. minus hirsuta, foliolis minoribus angustioribus.—Rio Pardo and Serra da Chapada, *Riedel.*

C. *turbinata*, p. 109.—Serra da Chapada, *Riedel.*

After C. *bella*, p. 110, add:

C. *Purdiæi*, (sp. n.); ramulis petiolisque ferrugineo-puberulis, stipulis lanceolatis rigidis, pinnis 8-12-jugis, foliolis multijugis oblongo-linearibus obtusiusculis parvis, pedunculis fasciculatis rigidis petiolo communi brevioribus, floribus sessilibus glabris, calycibus tubulosis glabris dimidium corollæ glabriusculæ æquantibus.—Affinis C. *bellæ*, stipulæ majores, pinnæ pauciores, foliola minora sæpius ciliolata. Calyx 3 lin., corolla 6 lin. longa. Stamina numerosa, longa, intense colorata.—Mountains of Ocana, Columbia, *Purdie.*

PITHECOLOBIUM, *Lond. Journ. v. 3, p.* 195 *to* 223.

P. *macrostachyum*, p. 198.—Since I have seen Von Rohr's specimen of the species described by Vahl, I am inclined to think that I have confounded two distinct plants. In the one, P. *macrostachyum*, independently of the great length of the spike, the flower itself is half an inch long, and the staminal tube projects an inch beyond it; this species I have only seen from Cayenne. The other, P. *lanceolatum*, is indeed variable as to dimensions, but I have never seen the flower more than three lines, nor the staminal tube projecting more than two lines beyond it; the form and size of the bracts are also very variable. This would include all my synonyms and stations except Vahl's.

P. *dulce*, p. 199.—*Acacia obliquifolia*, Mart. Gal. Bull. Acad. Bruss. 10, pars. 2, p. 317.

P. *forfex*, p. 199.—New Granada, *Linden*, n. 1517; Santa Martha. *Funcke*, n. 404.

After P. *diversifolium*, p. 201, add:

P. *sericiflorum*, sp. n; glabrum, stipulis spinescentibus recurvis, pinnis bijugis, foliolis bijugis oblique obovatis ellipticisve rigide membranaceis v. subcoriaceis, capitulis paucifloris ovato-globosis, calyce glaberrimo corollæ dense sericeæ dimidium superante, tubo stamineo longe exserto.—Folia fere P. *candidi* sed flores diversissimi. Bracteolæ parvæ; calyces 4-4½ lin. longi infundibuliformi-tubulosi; corollæ 7 lin. longæ, densissime sericeo-pilosæ. Stamina numerosa, plus 2 poll. longa, tubo corollam 6 lineas excedente.—Venezuela, *Funcke*, n. 536.

P. *lætum*, p. 203.—*Inga læta*, Pœpp. et Endl. Nov. Gen. et Sp. 3, p. 80.—*Pithecolobium polycarpum*, Pœpp. et Endl. l. c. p. 81.—After receiving this work I again compared the specimens of these two plants, the one in flower, the other in fruit, and cannot but feel persuaded that they belong to the same species. Both were gathered in the neighbourhood of Yurimaguas in the province of Maynas, the one in April, the other in February.

Add here the three following:

P. *filamentosum*, sp. n.; glabrum, pinnis unijugis, foliolis unijugis? oblique obovatis oblongisve coriaceis obtusis, pedunculis elongatis tenuibus, capitulis ovatis, floribus glabris breviter pedicellatis, calyce turbinato corolla plus duplo breviore, tubo stamineo incluso.—Specimen valde diffractum sed ex fragmenta petiolorum pinnæ unijugæ videntur, foliolis cujusve pinnæ geminis v. forte solitariis. Hæc 2-3 poll. longa sunt, 1½-2 poll. lata, venis utrinque perspicuis. Pedunculi tripollicares. Capitula racemiformia, basi subinterrupta. Corolla 2-2½ lin. longa.—Rio Doce in Brasil, *Martius* in herb. Hook. under the name of *Inga filamentosa*.

P. *turbinatum*, sp. n.; glabrum, pinnis unijugis, foliolis 1-2-jugis oblique obovatis v. ovali-oblongis obtusis coriaceis nitidis, pedunculis elongatis, floribus brevissime pedicellatis, calycibus turbinatis dimidium corollæ æquantibus.—Valde affine P. *filamentoso*, sed foliola majora videntur, sæpius in pinnis bijuga, et flores duplo saltem majores, brevius pedicellati. Calyx saltem 2 lin., corolla 4 lin. longa.—Bahia, *Lushnath*.

P. *furcatum*, sp. n.; glabrum v. minute canescenti-puberulum, pinnis unijugis petiolo communi partialibusque alatis, foliolis unijugis oblique obovato-oblongis obtuse acuminatis, spicis ovatis, calyce minute puberulo turbinato-tubuloso quam corolla sericeo-pubescens duplo breviore, tubo stamineo longe exserto.—Species petiolis more *Ingarum* alatis insignis. Foliola 3-4 poll. longa, 1½-2 poll. lata, glabra at non nitida. Corolla 5 lin. longa.—On the Rio Teapa in South Mexico, *Linden*, n. 723.

I would mention here another species, singular as to its foliage, in the herbarium of the British Museum from Cayenne, belonging either to this genus or to *Calliandra*. The leaf, like that of P. *unifoliatum*, appears at first sight simply pinnate with one pair of leaflets, but the articulation of the petiole shows that instead of being as in that species composed of two unifoliolate pinnæ, the two leaflets belong to one pinna, whilst the opposite pinna is deficient.

In Andrieux's Mexican collection there are two species from Acatlan, (n. 403 and 393) both very distinct from any others known to me; but as the one has the stipules and flowers of a *Calliandra*, with the leaves and glands of a *Pithecolobium*, and the other, on the contrary, has the flowers and stipules of a *Pithecolobium*, with the leaves of a *Calliandra*, I refrain from describing them until the fruit shall be known to determine their genus.

P. *trapezifolium*, p. 204.—*Mimosa atakta*, Steud. Flora, 1843, p. 758, after which, add:

P. *Benthamianum*, Miq. Linnæa, 18, p. 592, from Surinam, is said to be between P. *trapezifolium* and P. *lusorium*, two species which are perhaps already too closely allied.

P. *lusorium*, p. 204.—Near Villa Rica, *Riedel*.

After P. *subacutum*, p. 210, add:

The *Inga elliptica*, Blum. I. *leucoxylon*, Hort. Bog., I. *purpurascens*, Hort. Bog., I. *falcifolia*, Hassk., and I. *borbonica*, Hassk., Hort. Bog. p. 291, 292, are all probably *Pithecolobia* belonging to the section *Clypearia*.

P. *glomeratum*, p. 213.—British Guiana, *Schomburgk, 2nd Coll.* n. 469 (758). Closely allied to this species is:

P. *cognatum*.—*Inga cognata*, Schlecht. Linnæa 12, p. 560. —Hot region of Mexico, *Schiede*. The common petiole is so short, that the leaves appear at first sight to be simply pinnate.

P. *lasiopus*, p. 214.—*Inga ramiflora*, Steud. Flora, 1843, p. 759.

P. *cauliflorum*, p. 214.—To this species appear to be referable *Schomburgk's* specimens, *2nd Coll.* n. 822 (1415).

After P. *auriculatum*, p. 217, add:

P. *longiflorum*, sp. n.; ramulis petiolisque ferrugineo-tomentellis, pinnis sub-5-jugis, foliolis 12-20-jugis oblique rhombeis ad angulum interiorem sæpe obtuse auriculatis utrinque glabris ultimis falcato-oblongis, pedunculis axillaribus, floribus maximis minute ferrugineo-tomentellis, corolla calyce subquadruplo longiore, ovario sessili glabro. Affinis P. *auriculato* et P. *adianthifolii*, folia fere prioris, flore potius

P. *adianthifolii*. Corolla 10-11 lin. longa; tubus stamineus longiuscule exsertus.—Santarem in Brasil, *Riedel*.

P. *polycephalum*, p. 219.—*Schomburgk's* n. 525 (824) of the 2nd Collection appears to belong to this species; n. 571 (806) of the same collection is in some respects near to it, but my specimen is insufficient to describe.

P. *corymbosum*, p. 221.—*Inga trapeziformis*, Steud. Flora, 1843, p. 759.

P.? *comosum*, p. 221, must be referred to *Calliandra*.

SERIANTHES, *Lond. Journ.* 3, *p.* 225.

The Taiti plant, of which I have now seen flowers, is, as pointed out by Dr. Planchon, a distinct species, S. *myriadenia*, Planch. The calyx is short (1-1½ line long) and the corolla about 7 lines. The fruit appears to be the same in both species.

INGA, *Lond. Journ.* 4, *p.* 577 *to* 622.

I. *Jinicuil*, p. 585.—Mexico, *Jurgensen*. n. 594.
I. *vera*, p. 615.—Santa Martha, *Funcke*, n. 537.
I. *xalapensis*, p. 616.—Mexico, *Jurgensen*, n. 595.

Description of PLEUROPETALUM, *a new genus of* PORTULACEÆ, *from the* GALAPAGO ISLANDS; *by* J. D. HOOKER, R.N. M.D. F.L.S.

TAB. II.

CHAR. GEN.—*Calyx* dipsepalus, persistens, sepalis basi connatis. *Corolla* 5-petala, petalis hypogynis ovatis concavis coriaceis dorso multi-costatis, æstivatione imbricatis. *Stamina* 8; *filamenta* infra medium monadelpha; *antheræ* biloculares, erectæ, longitudinaliter dehiscentes. *Ovarium* liberum, globosum, uniloculare. *Ovula* plurima, placentæ basilari funiculis distinctis elongatis inserta, amphitropa. *Stylus* brevissimus. *Stigmata* 4 paulo divaricata, teretia. *Capsula* —?

Suffrutex (?) Galapagæus *erectus,* glaberrimus, *ramis teretibus, superioribus foliosis.* Folia *integerrima.* Flores *in racemos terminales lateralesve dispositi, breviter pedicellati.*

1. Pleuropetalum *Darwinii,* Hook. fil. in Trans. Soc. Linn. Lond. ined. — (Tab. Nostr. II.)

Hab. James Island, Galapagos; *C. Darwin, Esq.*

Rami cylindracei, teretes, crassitie pennæ cervinæ, ramulis foliiferis breviusculis. *Folia* alterna, petiolata, 2-3 unc. longa, 1-1½ lata, anguste ovato-lanceolata, utrinque attenuata longe acuminata, integerrima, costa venisque conspicuis, petiolo ¼ unc. longo. *Racemi* subunciales, 5-7 flori, pedicello valido tereti superne florifero. *Flores* breviter pedicellati, sub 3 lin. lati, pedicello crasso tereti. *Calycis foliola* ovata, acuta, concava, petalis ⅛ breviora. *Petala* ovata, subacuta, concava, siccitate coriacea, dorso præcipue costis plurimis parallelis percursa, erecto-patentia. *Stamina* infra medium in cupulam membranaceam coalita, filamentis anguste subulatis. *Ovarium* globosum, subcarnosum. *Stigmata* paulo divaricata, subobtusa.

A very distinct genus, of which I have seen only the specimens gathered by Mr. Darwin during the visit he paid to these curious islands in H.M.S. Beagle. The habit of the plant is somewhat like that of *Rivina.*

Tab. II.—*Fig.* 1. Bud, pedicel and bractea; *fig.* 2. a flower expanded; *fig.* 3. the same with the petals removed; *fig.* 4. ovarium :—*all magnified.*

BOTANICAL INFORMATION.

Botanical Notes on a Journey into the interior of Southern Africa, in company with Mr. Burke; by Charles L. Zeyher.

(The following journal may be considered an accompaniment to that of Mr. Burke, detailing the account of an ex-

cursion to the north of Uitenhage which extended nearly to the Tropics. Mr. Burke's object was chiefly Zoology; Mr. Zeyher's, as might be supposed from what is said of him in our last volume, p. 643, was Botany, and in that department he has been eminently successful, as the public will soon be made aware by the vast collections he is at this moment arranging for distribution.—Ed.)

The village of Uitenhage is about fifteen miles distant from Algoa Bay towards the north, and is situated on the western side of a little hill belonging to the valley, through which the Zwart Kops River finds its way to the sea. The streets are laid out regularly, and spacious gardens are connected with almost every house. A fine streamlet of pure water, rising from a spring seven miles distant, at the feet of the Winterhoek Mountain, fertilizes the ground in those gardens, and serves also for domestic purposes. The soil is very fertile, and fruit trees as well as culinary plants thrive where the land can be irrigated. The *Orange*, *Lemon*, *Guava*, *Loquat*, *Pomegranate*, and *Fig* are the usual trees in those gardens; but the *Apple*, the *Pear*, and the *Plum* agree also well with the climate, and the few sorts cultivated here come to tolerable perfection. A great part of the country surrounding this village, is covered with dense woods, composed of small trees, interwoven with many thorny climbers, rendering it scarcely possible to enter the thickets, which are infested by several sorts of antelopes, and the buffalo. The most conspicuous Orders of trees are the *Tiliaceæ*, *Terebinthaceæ*, *Sapindaceæ*, *Celastrineæ*, *Ochnaceæ*, *Portulaceæ*, *Leguminosæ*, *Compositæ*, *Ebenaceæ*, *Cappbarideæ*; but as they seldom exceed twenty feet in height, their wood is of scarcely any use, except for fuel. The *Crocoxylon excelsum*, *Schottia speciosa*, *Pteroxylon utile* and *Pappea Capensis* are the loftiest trees in these groves.

We left Uitenhage the 10th of November, passing through a thicket immediately on quitting that village; and soon entered an open tract, composed of fine pasturage, and

shaded by clumps of *Acacia Capensis*, called "Doornboom" by the Dutch inhabitants. We took our encampment at "Sandfontyn" a farm seven miles from the place of our departure, and situated at the base of the south-eastern extremity of a very extensive mountain range, called here the Winterhorn mountain; but it receives several other names, although it is the continuation of one mountain chain. Some points of this range which are visible from here, are considerably high. The Zwart Kops River, with its tributary, rises in the southern declivities. The course of this mountain range may be traced as far as the north-western boundary, close to the border of the Bushman country, where it divides itself in little hills, bordering that level tract. With regard to vegetation, this mountain chain forms a very conspicuous line between two of our principal regions.

The territory south and west, to the shores of the Atlantic and the Indian Oceans, is the central locality of the two extensive and beautiful orders, the *Proteaceæ* and the *Ericaceæ*. The country beyond the mountains, towards the east and north, as far as the banks of the Orange River, presents nearly always the same character; for, immediately at the northern side the "*Karroo*" or South African desert, commences with its peculiar productions. The *Ficoideæ*, *Euphorbiaceæ*, *Asclepiadeæ*, *Byttneriaceade*, *Geraniaceæ*, and *Compositæ* are the most conspicuous orders; many species of *Mesembryanthemum*, *Euphorbia*, *Stapelia*, with very peculiar flowers, as the curious *Scytanthus Gordoni*, figured in Hooker's *Icones Plantarum*, tab. 623, which is a native of that desert, growing near the Gamtka River, and on similar localities in the Bushman country. Of *Compositæ*, the *Euriops*, *Osteospermum*, *Tripteris*, *Gamolepis*, *Gazania*, *Gorteria* are prevalent. *Hermas Dregei*, (Mey.), *Brachystelma Comaru*, (Mey.) *Sarcocaulon L'Heritieri*, *Patersonia*, *Burmannia*, and several species of *Hermannia* form the principal groups of plants there. The vegetation in the where we now are, shows another character; the

greater part of the depressed country is covered with thickets, as far as the lower parts of the higher mountains; little mountains and hills are covered with the same thickets, and the open spaces afford superior pasturage. The higher part of the mountains hereabouts is free from wood, and chiefly covered with useful herbs and grasses. The *Proteaceæ* and *Heaths,* although there are several fine species in these mountains, are not so freely dispersed here as on the mountains nearer the Cape. The real South African forests, with useful trees for timber, are scattered generally along the southern shores or in the ravines of the southern sides of mountains nearest to the southern sea-coast. The principal masses of forests are at Kneisona, at Zizikamma, Olifantshack, and about the Kowie River, where the *Podocarpus Thunbergii, Oreodaphne bullata, Boscia undulata, Sideroxylon melanophleum, Pteroxylon utile* grow to very high trees, useful for many kinds of husbandry. The *Erythrina Caffra* may be considered the king of the forest in Albany and Olifantshock, on account of its size, but the wood is of little use, except for shingles, which are considered very durable; but as the mode of thatching houses with shingles is not much adopted in the Cape colony, the valuable quality of that tree is scarcely known but to a few inhabitants.

We made several excursions on the neighbouring mountains; they were covered in many places, to an elevation of nearly 800 feet, with those kinds of thickets; and in some ravines were also forests, sheltered from the parching sun by high precipices. The *Helichryseæ, Aspalatheæ, Geraniaceæ, Campanulaceæ, Polygaleæ, Diosmeæ, Saccharineæ, Chloridæ* and *Festuceæ* were very conspicuous among the mountain vegetation to 2,500 feet of elevation. We had the opportunity on these excursions to see that remarkably large spring rising in these mountains, which supplies the village of Uitenhage with water; the quantity of water, which rises out of this spring, is considerable, and never diminishes, even in the driest summer months.

Soon after we left Sandfontyn, we passed the Koega River, a mere periodical stream, seldom showing a continual surface of water, except when heavy rain falls, when it becomes a torrent, and impassable for a short time. The banks were thickly covered with the *Acacia Capensis*, extending from one side of the hill to the other, in the valley through which that river holds its course to the sea-shore. A party of lions have for several years chosen these thickets for their favourite resort, and caused a great deal of damage amongst the horses and cattle of the neighbouring farmers. A good many hyænas also live there during day-time, and cannot be routed out; and a few black rhinoceros ramble still through the thickets, being the last remnants of their race within the colony. We ascended gradually a hill called the "Grasrugg," on account of its open feature; it is chiefly covered with a good pasturage, and is also remarkable in a geological point of view; the greater part of that hill, or ridge consisting of horizontal strata of a soft kind of limestone, mixed in succession with layers of sea-shells, at an altitude of about 500 to 600 feet above the sea. The summit of the ridge is nearly level, and its vegetable productions correspond with the soil whereon they grow; they have a peculiar habit, by which the presence of lime may be suspected beneath. The principal of those plants are the *Hermannia holosericea, conglomerata, involucrata, Xerothamnus Ecklonianus, Psilothamnus adpressifolius, Lyperia microphylla, Acmadenia muraltioides, Helichrysum recurvatum, Muraltia ruscifolia, Deverra Burchellii, Ficinia præmorsa,* and some others.

After a few miles' travelling on this elevated tableland, we descended the eastern side, passing over a tract covered with small shrubs of *Compositæ, Ficoideæ, Euphorbiaceæ* and *Gramineæ*. We threaded for some time a narrow valley, called the "Koegakammaskloof," where the *Rhigozum trichotomum*, a begnoniaceous plant, for the first time appeared, with many succulent plants, as several species of

tree-like and suffruticose *Aloës*, the *Rochea falcata* and *perfoliata*, many *Crassulas*, &c., &c., they grow in a red loamy soil, mixed with gravel of limestone or quartz. We reached the Sunday River directly after leaving that narrow passage; the tide of the sea comes up as far as where we met that river. Small trees of the *Niebuhria Caffra*, *Capparis oleifolia*, Burch., were growing on the wayside, a *Salix*, *Combretum salicifolium*, *Chilianthus arboreus*, and *Rhus pubescens*, formed the border on the banks of that river. The *Plumbago Capensis*, growing amongst the bushes, showed its bright blue flowers through the thorny branches of the *Celastrus reflexus*. From the Komandokraal, where we halted one night, the right flank of the Sunday River has a singular aspect; an elevated line of hills, covered with dense wood, extends to the immediate bank of the stream. The abrupt appearance of the ridges facing the river, without vegetation, denotes that the encroachment of this stream towards those hills has caused the slipping of the soil. There are strata of a soft limestone visible towards the top of these ridges; it is a favourite spot of the *Testudinaria Elephantopus*, which grows here frequently. The stem of this curious plant attains sometimes more than four feet high, and nearly the same in diameter. It is only covered with a comparatively thin layer of bark, or woody substance, and the whole mass within is a kind of pulpy vegetable tissue, like the inside of a large turnep. It is of little service as food to mankind, but is a favourite vegetable of the Baboons, who cleverly make a hole in the stem, large enough to allow their hands and arms to enter, when they empty the contents of the inside, leaving the rest of the outer bark whole. It often happens afterwards that swarms of bees take possession of these hollow stems, and fill them with honey, offering a still more pleasant meal for the baboons, should it happen that they fall in with those bee-hives before a Hottentot or a badger has emptied them. Fond as the baboons are of honey, they are great cowards of the sting of bees; they take with great caution the honey-

comb, and run with all speed a considerable distance before they eat the honey; and as the bees become alarmed by this robbery, the baboon takes care not to repeat this trick unless the bees are quiet again.

On the following day we directed our course towards the Adow, an elevated tract, or continuation of hills, commencing near the shores of the Algoa Bay, and running from south to north; they are thickly clad with wood almost to the summit, like the whole country. The tops, however, are covered with the finest pasturage, green nearly all the year round. Here the climate is cool and pleasant, owing to a moist atmosphere from the sea, and presenting a great contrast to the country below towards the Sunday River, with its dreary appearance during the summer months. Below, in some sheltered valleys, grow many trees useful for timber, as *Podocarpus Thunbergii*, (Hook.), *Pteroxylon utile*, *Crocoxylon excelsum*, *Fagara armata*. On the higher part grow shrubs of *Flacourtia rhamnoides*, *Prockia rotundifolia*, *Eriudaphus Zeyheri*, (Nees), and *Tecoma Capensis*, that highly ornamental shrub. The formation of limestone may here also be traced towards the top of the hills, but in general the surface is covered with a soil of reddish clay. In the forests, on the stems and branches of trees, grow several sorts of Epiphytes, belonging chiefly to *Angræcum*. Many birds inhabit these woods, of which the Louri, with its fine plumage, is not a rare one. The Buffalo, *Tragelaphus sylvatica*, and *Cephalopus cœrulea*, are the principal game in these woods. The Adow bush was famous in former years for numerous herds of elephants, traversing during night the country and the public routes, when it was scarcely safe to travel or to halt there in the dark. Several accidents happened to persons, who remained out during the night; they were attacked by those huge animals, their waggons broken, and occasionally some of their oxen killed. Only a few stragglers still live in those woods, and their number being small, they are more timid than formerly.

Leaving the Adow hill, we entered the Quaggas' flat, which is generally covered with good pasturage, and is about seven miles in length; it is encircled with low hills, thinly shaded by the *Acacia Capensis*; on the roots of which the curious parasite, the *Sarcophyte sanguinea*, grows, showing through the carpet of green its red stem and flowers. Several troops of spring-boks, bounding in the air, when our dogs chased them, and seeming as if they never touched the ground, were the first we saw of that kind since we left Uitenhage. After quitting the flat, it is only a short distance to the Bushman's River, which we crossed the next day, and ascended the Bushman's River hill, where we stopped one night. The *Cephalandra quinqueloba*, several *Ceropegiæ*, *Cacalia scandens*, and *Senecio deltoideus* are the climbing plants in these thickets, together with some *Apocyneæ*. On a moist spot, not far from our camp, appeared *Ophioglossum Capense*, but without perfect fructification; and also *Marsypiolepis Zeyheri*, (Harv.); while some calcareous plants, viz. *Lyperia microphylla* and *pinnatifida*, *Pilothamnus*, &c., indicated the presence of limestone on the sides of the hill. In the thickets were *Sida triloba* and *Sonneratiana*, *Gnidia linioides*, *Plectranthus Thunbergii*, *hirtus*, *Ocymum serpyllifolium*, the prevailing herbs in the shade, besides many succulent plants, as *Crassula lactea*, *cordata*, and *perforata*, *Cotyledon ramosissimum*, and several species of *Drimia*, *Hypoxis*, *Ornithogalum*, *Sanseviera*, and others.

We obtained an extensive view from that hill over the surrounding country; with a considerable part of the Zuureberg range, running from north-west to south-east, and which we had to pass. The character of the soil and its vegetation changed soon after we left that place, and passed the small village of Tidburg close to the right hand. It was several hours before we entered the principal part of the mountain, the first beginning of it is called the Zwartchoogde, where greater masses of rocks appear more frequently, chiefly sandstone. The *spomœa crassipes*, (Hook.),

is one of the rarest plants that grow here, as well as in the interior. *Helichrysum milleflorum, ferrugineum, Dais anthylloides, Bupleurum Mundii, Morysia pinnata, Cyperus flavissimus,* (Schrad.), *Harpechloa Capensis,* (Kunth), form a part of that mountain Flora. But one of the rarest and most interesting is the tree-like *Oldenlandia Arbuscula,* (DC.), with its large capitula, the size of an artichoke, or like *Protea cynaroides*; the tree bears a great resemblance to *Leucospermum conocarpum,* or *Protea grandiflora,* on account of which the Dutch call it Wagenboom, which is the name of the latter tree. It grows only in this mountain range, and sparingly in a few spots; its natural locality is on rocky places in a rather mixed soil, composed of peat and loam. The vegetation of this range is rather rich, especially in herbaceous plants, owing to its elevation and its being the first range of mountains from the shores of the southern coast; a great part of the moisture of the atmosphere, wafted by the sea-breeze, is attracted and condensed towards the higher point of the mountain, and forms a climate essential to the growth of many species of plants. By reason of this favourable circumstance, there exists a great resemblance between this and the much higher Winterberg mountain range, in respect to their vegetable productions. The *Kohautia Amatymbica, Oldenlandia Caffra, Pulsatilla Caffra, Geum Capense, Polyactium Caffrum, Psilostoma ciliata,* (Klotzsch), *Bluffia Eckloniana,* (Nees), *Erianthus Ecklonii,* (Nees), &c., &c., are natives both of the Winterberg and this mountain chain. The weather became very boisterous and rainy, which is not unusual here, and we had not yet reached the eastern extremity when we were obliged to halt for a day on the mountain, for fear any accident should befall our waggons on that bad road. Close to our encampment, amongst shrubs of *Cliffortia strobilifera* and of *Restio,* in the course of a small rivulet, grew the *Lubinia atropurpurea,* a primulaceous plant, showing its dark red spikes amongst a multitude of other flowers.

After the weather cleared up, we proceeded to Graham's Town, situated on the eastern slope of the same mountain range, and exposed to many disadvantages, by the influence of those mountains. Violent bursts of wind, often accompanied by thunder and lightning, with fatal consequences, are the general annoyances of this little country town. It is surrounded by less high hills towards the east and north-east, thinly covered with *Acacia* trees, under which grow luxuriantly many kinds of useful herbs and grasses, so that large and fine flocks of sheep are kept at the neighbouring farms. We halted to purchase some fresh provisions, only a short time here, for fear our men should smuggle brandy to the waggons, which they often cleverly manage to do, and afterwards become insolent and quarrelsome. They showed already symptoms for getting "*lekker*," an expression in the Dutch language in general use amongst these depraved people; they tell with great delight one another the feeling of being "*lekker*;" it is scarcely possible for a person, who understands the real meaning of it, to translate it in any way better and more positive than with "*dulce consenta*," and many a one would, if he could, stimulate that sentiment till all feeling is gone.

After travelling for some hours over a rugged country, with the same appearance as the country about Adow and the Bushman River, we arrived at the summit of a high embankment, called the Fish River Hill. A similar mighty wall nearly 1000 feet high rises opposite, and both form an extensive valley, at the bottom of which the Great Fish River finds in a serpentine line its way to the ocean. The slopes of that mighty gulf are for the most part covered with thickets of trees, like those about the vicinity of Uitenhage; but the tree-like sorts of *Aloë* seem to be more abundant here than on the latter place. The *Loranthus Drègii*, a fine parasitical plant, occurred for the first time; it grows chiefly on *Rhus longispina*, and other species of the same genus; many *Acanthaceous* plants of the genera *Hypoestes*, *Gendarussa*,

Phytiglossa, Barleria, several *Graminieæ,* chiefly *Paniceæ,* and several succulent *Crassulaceæ, Ficoideæ* and *Euphorbiaceæ,* associate in the shade of those thickets. After our descent, we followed upwards the course of that river for a few hours, till we crossed it. There were not many plants in bloom, except a fine *Ipomœa* and the *Grewia obtusifolia,* which presented their showy flowers on some places along the banks of the river. A kind of blue slate forms the greater part of the bottom of this extensive valley, in which the Great Fish River has worn a considerably deep channel: although the banks on both sides were steep we had no accident when passing it. The Great Fish River and the Sunday River are both periodical streams, and rise together in the Sneewbergen, or Snow Mountains, a district where, during summer time, heavy thunder showers frequently fall, which cause these rivers to be impassable for several weeks. However, fortunately, there was scarely any run of water in either when we passed them. The banks are shaded with nearly the same kind of trees as those of the Sunday River. Some buds of the *Acacia Capensis,* opening already, showed their yellow flowers. The soil along the banks is generally very rich, being alluvial; still very little of it is cultivated, on account of scarcity of streams or springs which can be used for irrigation. The water of the Fish River runs useless to the ocean, and could only be employed for that purpose at great expence. As the caterpillars of many *Lepidoptera* had commenced devastations among the young shoots of the *Acacia* and other kinds of trees, several kinds of cuckoos had arrived from their migratory trip, and seemed to be enjoying their frugal meal. *Cuculus clamosus, auratus, Klasii, serratus,* and a few specimens of C. *solitarius,* inhabited the woods near the river, with *Upupa Africana. Cucoulus auratus* and *Klasii* are the finest; they seem to be careful not to spoil their fine plumage, but give the hatching and feeding of their young ones to the care of the common sparrows and other small birds.

We ascended with great toil the height on the left side,

which is very steep towards the summit, and our waggons were loaded heavily. Arriving at the top, the country had an undulated, but nearly level appearance; as far as we could see it was an open grass land, in some places thinly shaded by the *Acacia Capensis*, which grows more slender here than on the banks of rivers in a more fertile alluvial soil; for which reason some botanists consider them distinct species, on account of the different habit when inhabiting a rich or a poor soil. In the first case, the branches, and especially the thorns, are larger, particularly on young and vigorous trees grown in a habitat more exposed to wet or to regular winter rains, where the soil is more exhausted of its fertile property, through a constant process of vegetation. On the other hand, if vegetation is slumbering sometimes for a long period through want of rain, the fertility of the soil is longer preserved.

We now took a northerly direction, leaving at a considerable distance to the right the Kakaberg, a promontory of the high Winterberg chain; it forms the easterly border of Smalldeel, a province belonging formerly to the Geika family, chieftain of a Kaffir tribe, but ceded to the Colony about twenty years ago, and over this we now travelled. The slopes to the summit of the Kakaberg are covered chiefly with forests of useful timber: in the rear may be seen the higher naked tops of some peaks of the Winterberg range. The vegetation of that elevated country is nearly the same as on the other side, towards Graham's Town. A few plants of *Eriosema puberula*, *Lasiospermum radiatum*, *Tritomanthe Uvaria*, and some *Pelargoniums* were in blossom. We fell in with a river, called the Babians River, a tributary of the Great Fish River. It rises in the Winterberg range, and the banks towards that mountain are covered with forests of fine timber trees. Pringle, in his poems, gives some idea of the fine scenery in that lovely valley, occupied chiefly by the relations of the poet. We crossed that river, and soon arrived at the feet of a mountain passage, called *Daggaboersneik*. It was several hours before

we reached the highest part of it; it is a very inconvenient pass for waggons, on account of the bad state of the road, over a rocky sandstone. The point where we passed is only a part of the height of a mountain chain, which unites the Sneewberg with the Winterberg range, and through which the Great Fish River has forced its way. Our route bending round the edge of the mountain, at a considerable height, we beheld that river down a slope, passing through the narrow mountain gulley. Before descending to the region lying before us to the north, it is worth while to mention the different appearance of the country which we have just left, from that which we were to enter. A remarkable line of vegetation runs from here in a south-westerly direction as far as the Winterhoek mountain chain, forming the northern boundary of the principal forest region, with its peculiar features; which we have mentioned as the principal character of the lower country in the district of Uitenhage. That line forms, at the point where we are, an angle; taking a south-easterly direction, it follows the Winterberg mountain chain down into the Kaffir country, and constitutes the eastern boundary of that Flora.

We should have gained an extensive prospect from our elevated post, towards the northern country; but the view was much limited by several promontories of the high Snowy Mountain chain, running in various directions. The course of the great Fish River was marked by dark green banks, contrasting with the death-like appearance of the Karroo, or desert, below us, to the north. The descent down the northern side of Daggaboorsneck was not quite so steep as the southern ascent; but the road was bad and stony, and threatened to overturn our waggons. What a contrast did we meet as we entered the Karroo, in comparison to the green and fertile land we left on the opposite side of the mountain! The greater portion of the vegetation here seemed all dead and dried up by the rays of a burning sun, except some succulent plants, which are not in the least affected by a roasting heat. Every blade was dry, and it seemed that part of the country

had enjoyed no rain for a long while. Apprehensive of the danger occasioned by the drought, and our oxen finding scarcely any food, we travelled with more speed over that arid district. We passed the Tarka River, a little above its junction with the Great Fish River; it rises in the Bambusbergen and the Stormbergen; the length of its course is about 100 miles.

We crossed several times the Great Fish River, and reached on the 3rd of December, the village of Cradock; rather a small place, though the seat of the principal functionary of the district. It is situated in a narrow valley, on the banks of the Great Fish River, which supplies it with water. A mighty spur of the Sneewberg stretches to the bank of that stream, and continuing from the left side, runs up towards east, and joins the Bambusberg. We remained a few days near Cradock, in order to have some things repaired in our waggons, and took our station on an elevated spot, close to a mineral spring, opposite the village, hoping to have the water near for our use; but we found it of such a bad taste and smell, that it was hardly fit to drink; as it seems to contain sulphuric air in considerable quantity, it may have a good effect in cutaneous diseases. The village is situated on a fertile spot; the soil having been mostly deposited here, in former times, by the overflowing of that river. Fine gardens, planted with fruit-trees, grapes, and vegetables, bear witness to the good quality of the soil. The climate, however, is not a very healthy one, owing to its sudden changes of temperature. The heat, during summer, is often insupportable, on account of the narrow valley, more than half enclosed by very high and barren mountains, and the other part by lower hills and the Karroo. The heat would be still greater, were it not cooled by a strong breeze of wind during the afternoon, pouring down from the high mountain region, in order to restore the equilibrium of the atmosphere, too much expanded by the heat below. Those gusts of wind prove a great annoyance to the inhabitants, carrying clouds of dust through the streets into their houses. Cradock is as cold again during winter; the high mountains, on one side, being covered with snow

and ice during three or four months. The climate of these mountains is very severe, and dangerous to persons who are on their march during bad weather; and several lives have been lost at such periods. It is certain that the feeling of cold, on those high mountain regions, is more cutting than in a plain country, even where there is only the same degree of cold, but where the pressure of the atmosphere is greater than on elevated spots; and it seems, the less the pressure of the atmosphere acts upon our skin, the greater is the sensation of cold; or perhaps, the more do we give of our bodily heat to the surrounding atmosphere.

We left Cradock on the 5th of November, proceeding in a northerly direction, and passed, at a short distance higher up the Great Fish River whose course we followed nearly all day, another mineral spring, which is used as a bath, and known to be highly efficacious in rheumatic complaints. From this place we were continually ascending towards an elevated region. The appearance of the country, with regard to vegetation, was like the Karroo, intermixed, more or less, with grass and other useful herbs, chiefly of the Natural Orders *Compositæ*, *Byttneriaceæ*, *Geraniaceæ*, *Stipæ*, *Agrostideæ*, *Festucaceæ*, the three latter particularly adapted to sheep farming, of which we passed several extensive establishments that day. The weather was hot during the afternoon, and the northern horizon assumed a very dark appearance, and before evening the rain poured down in streams, accompanied with awful thunder and flashes of lightning. We expected that this weather would be soon over, and pursued our journey; but the rain continued with increased vehemence, so that the whole level tract over which we travelled, was quite inundated, and like a large stream. The night commenced without my finding any spot where we could span-out; and there was imminent danger, for the ground became swampy from the heavy rains, that our waggons would stick fast in the mud. We reached, at last, a safe place, on the right bank of the Great Fish River, where we could safely remain for that night. The weather

cleared up soon afterwards, and we expected to proceed on our journey the following morning, but to our great disappointment, the river had become quite a torrent, and was impassable for the next two days.

The general aspect of the country was level, and at a distance to the north and east, belted by small hills. Looking back to the coast, we saw the easterly spurs of the loftier Snow Mountains. Considering our elevated position, at least 2000 feet above the level of the sea, we had expected some change in the distribution of plants, according to the adopted rules of elevation; instead of the species growing in a depressed, desert-like country, we should have met already with plants, growing on elevated spots, in a moist atmosphere, as *Heaths*, *Proteaceæ*, *Diosmeæ*, *Restiaceæ*, &c.; but it is evident, that from some cause or other, no dependence can be placed on a theory, which proves to be not constant, at least in South Africa. In this district, the greater part of the moisture is carried from the Southern Ocean by breezes of wind; when approaching the first mountain range, and coming in a cooler atmosphere, it becomes condensed; therefore, an abundance of moisture is constantly deposited there; in consequence of which, we observe a luxuriant growth of many kinds of plants just mentioned, and numerous allied tribes belonging to a humid, mountain region. After the greater portion of damp is deposited on that range, a small quantity only is left behind to be carried by the winds farther into the interior, to the secondary ranges of mountains; and becoming more diffused from passing over an extensive barren tract, like a South-African Karroo, heated to a high degree by a burning sun, almost no exhalation from the sea can reach those inland mountains, and scarcely a cloud is visible towards their tops, while clouds are constantly resting on the summits and sides of the mountains of the first range, nearest to the sea.

Owing to the extreme dryness of the atmosphere behind the first mountain range, we may see there more elevated regions inhabited by plants, with the same capability of

enduring drought as those of a barren, dry, and more depressed tract of country. This is the case with regard to vegetation on the loftier part of Sneewbergen, the Roggeveld, and the Nieuwefeld Mountains, which have quite a Karroo-like character, similar to the dry and barren country, several thousand feet below; whilst the summit of those mountain chains, like the loftier tops of the Wittebergen and the Stormbergen, are chiefly covered with *Gramineæ.*

Moisture of the atmosphere, modified by the temperature of a climate, exerts a powerful influence on the spontaneous productions of the soil. At many places, on high, elevated regions, underneath a layer of peat, in which heaths and many plants of the same habit grow, may be often traced the same sort of loamy soil which prevails on those barren tracts where only Karroo-like and succulent plants can exist; may it not, therefore, be conjectured, that if these barren tracts had the same constant humidity of atmosphere as those in a more favourable situation, and shelter from a burning hot sun, there would be a mutual change in the vegetable productions into others, adapted to a moist and cooler climate? It would require certainly many hundred years ere such a change could be effected, and that a suitable soil, sufficient for the growth of those plants, should be accumulated.

The land here looked dry and barren, but is nevertheless celebrated for sheep farming, especially the Cape sheep, which thrive much best in a country like this, while the Merino prefers grassy tracts, as Albany, Uitenhage, George, and Zwellendam. The Great Fish River changes its name here to Brack River, which it retains up to the source; the principal trees shading its banks are *Acacia Capensis.* We crossed that river as soon as it could be done without risk, keeping it, for a short distance, to our left, then advancing in a northerly direction, chiefly over an open but barren Karroo-like country. Several farmhouses at very remote distances were in sight, and seemed to indicate a scarcity of springs of water in that part of the country; some more depressed tracts were marked by a line of dark green *Acacia* groves, which receive un-

doubtedly sometimes, when heavy showers of rain fall, a good share of moisture, and have besides that, a more rich alluvial soil, retaining moisture. Coveys of guinea-fowls resort to those thickets; and we had several dressed for our table; they take instinctively their night's rest on those trees, in order to be protected from their enemies, the *Putorius Zorilla*, *Ichneumon Caffra*, *Cynictis Ogilbii*, and the common Cape-fox, which are numerous hereabout, but live in holes, underneath the ground, during the daytime. The *Proteles typicus*, Smith, with the appearance of a striped hyæna and the size of a fox, is not rare, but subsists entirely upon ants. The *Viverra tetradactyla*, (Linn.), is also numerous; it is like a ferret, and eats beetles, and all kinds of insects. We often saw the *Sciurus Capensis*, or ground squirrel, a gregarious animal, living in troops under ground, and eating bulbs, roots, and seed.

The country had a very uniform appearance, scarcely deviating from its dry and barren character, with small scattered hills, composed of reddish sandstone, on which grew a few species of *Rhus*, some shrubby *Othonnas*, *Cacalias*, *Cinerarias*, *Stoebe*, and a few *Gramineæ*, springing up between the large globular masses of stone, in which the *Lepus rupestris*, a real kind of rabbit, of a rufous-colour, lives, feeding upon these kinds of vegetables. In some course, or channel, of periodical torrents, in a sandy soil, were specimens of *Hibiscus cucurbitinus*, (Burch.), in bloom; it is a plant with the habit of a *Cucurbitacea*, with depressed branches, and brownish-yellow flowers. This shrub seems to affect dryness, growing in the most barren spots, and keeps its leaf constantly green, without any rain, for a long while; irritation of the skin is caused by touching this plant.

We had gradually ascended since the time we left Cradock, and had consequently arrived at a very elevated region, perhaps not less than 4000 feet above the level of the sea. We encountered a few more thunder-showers on our route, so that the country will look better in a few weeks. As we went on, we passed a very remarkably shaped hill, standing

quite isolated, and rising from an already much elevated plain, upwards of 1000 feet high. This far-visible cone is called *Teabuss*, on account of its shape, which resembles a Dutch teapot The top is covered with a horizontal stratum of rocks; its sides are quite perpendicular, high, and inaccessible. Thousands of vultures have their resort and hatching-place on these rocks; some of these birds seem to enjoy themselves by sailing in the air for hours in circles, far above the summit of that mountain. We ascended, in hopes of making some acquisitions of botanical objects, but failed in our expectation, the plants on the upper part being as dry as those below, except a few succulents, such as *Euphorbia* and *Mesembryanthemum*. We had an extensive view over the surrounding plains and hills from this mountain; the tops of the latter presenting, in many instances, a table-like platform. The general formation is of reddish sandstone. The surrounding plains were inhabited by many sorts of game, as the black gnoo, hartebeest, bless-bok, spring-bok, ostriches, and quagga, or wild horse.

Leaving this place the same afternoon, and ascending gradually to an elevated region, we arrived, towards evening, at the side of a range of hills, called "Zuureberg," a mountain quite unconnected with that of the same name in the district of Albany, near Graham's Town, and spoken of on a former occasion. The name indicates the acid or sour quality of its pasturage, and was given by the farmers. It is a curious fact, that the sourness of a pasture is always indicated by the cattle chewing bones, which they never do where the grasses are quite sweet; they know, by instinct, what remedy to take for neutralizing the acidity in their stomachs. It was very interesting, sometimes, to see our oxen chasing each other to get hold of a bone out of the mouth of another. The farmers believe, from ignorance of the true state of things, that the cattle use these bones to sharpen their teeth, and generally affirm, that the teeth of cattle become sensible and painful, from the sour nature of their food; while the fact is, they chew and swallow the bones, as a cure for the internal acidity,

which would not be a remedy against the painful sensation of the teeth.

On account of the level appearance of our station, the country looked not much elevated; but comparing this table-land with other ascertained neighbouring heights, we must be at an altitude of not less than 5000 feet above the level of the sea; being the highest part, drawing lines of longitude or meridian from the Orange River to the southern sea-shores; its longitude being, to the nearest, 26° E., and 31° 30′ S. lat. The Great Drakaberg mountain chain marks a continuous line through the interior of South Africa, from beyond the Zoolu country, in a south-westerly direction; it assumes the name of Stormbergen when entering the Tambuki country, of which it forms the northern boundary. The latter mountain chain rises to 6000 feet, being abrupt towards the Tambuki country, and sloping moderately towards the Orange River. It is continued at the north-eastern boundary by the Bambusbergen, of which the Zuureberg may be considered a principal spur, projecting thence, in a north-westerly direction, for a considerable distance towards the Winterveld. But, in fact, this high table-land may be traced to the western end of the Roggeveld, running nearly parallel with the course of the Orange River, and sending its waters, to the north, into the Orange River, and south, to the southern sea-shores. The climate here, like that of the Sneewberg, Nieuweveld, and Roggeveld, is very cold in the winter, and sometimes the ground is covered for several days and weeks with snow. The country is well peopled, by reason of the permanent pasturage, attributable to a cool and moist atmosphere. Many hills are scattered over this high table-land, the greater part exhibiting horizontal strata of a reddish sandstone, so characteristic a formation of an extensive tract of country here. The land has a reddish and naked appearance, scarcely a bush can be seen; a few shrubs of some *Leguminosæ*, *Rhus serræfolia*, Burch., and a few *Compositæ*, grow upon rocky situations; but the *Gramineæ* form the principal part of the Flora; and among them, some sorts of herbaceous plants, of the

Orders *Asclepiadeæ*, *Convolvulaceæ*, *Byttneriaceæ*, and *Malvaceæ* vegetate, but they wither away during winter. The soil is a reddish loam, and very fertile; still it remains mostly uncultivated, on account of the dryness in a season when rain is most required, and the want of rivers or springs to irrigate any cultivated land; there is scarcely water enough for domestic purposes, and to keep alive the few trees and vegetables in the small gardens.

We travelled for several days over a tract, nearly like the last described. The course of the few rivers we passed is in a northerly direction, towards the Orange River, proving our descent towards that river. On the 19th of December, we passed Sternbergspruit, a tributary of the former, and constituting, from its source, through the whole length of its course to its junction with the Orange River, the north-eastern boundary of the colony, about 28° 40′ E. long., and 30° 40′ S. lat. We were now only a few miles distant from the Great, or Orange River, and our curiosity was excited to obtain a view of that fine and large stream. We were already pretty near, but could not see its waters until we had reached the verge of the high embankment, forming terraces of rocks, down to the stream, several hundred feet below. Owing to our position, it seemed to consist only of patches of water, like lakes, an illusion due to its serpentine course and high banks, which latter present a great contrast to the adjacent hills, being fringed with fine large trees, of a lively green foliage. The Willow of the Gariep, much like the Weeping-willow, *Zizyphus mucronata*, *Rhamnus celtifolia*, *Chilianthus arboreus*, are the principal trees which skirt its banks and, convey a pleasant impression to the traveller, who, after a journey of much toil, over a barren and dry tract, finds himself invited, at the scorching hour of noon, to refresh his drooping frame on the shadowy banks of a cool stream.

On account of heavy rains which had fallen in the Draka and the Wittebergen, the river could not be forded by wag-

gons, except with the aid of a raft or boat. We chose a raft, which had been only finished a few weeks before our arrival; it was placed at a narrow passage, where the river has forced its way through a ridge of rocky hills, just below a rapid, or fall, about 15 feet high. The raft traverses backwards and forwards on a rope, which is fixed on each side of the river. That place is called Sand-drift Point, where we remained for two days. The heat was very oppressive in this narrow valley, belted by hills of barren rocks, and sparingly covered with short shrubby plants or grass; but more annoying than the heat were the myriads of a kind of red ant, during the hottest hours of the day, on the level near the banks of the river where we encamped. They were furious, and neither dogs nor men, especially barefooted, could stand still for a moment to endure their bites. The place where we halted was situated below a hill, and we could clearly see from the top of it, towards the east, the higher parts of the lofty Witteberg mountain chain, about 7000 feet high, looking apparently white (whence its name), on account of the nature of the rocks forming that mountain chain, which are chiefly of a kind of white sandstone. The character of the vegetation of that mountain range, like many other mountains within the colony, presents always a barren view when seen from a distance; but the Botanist, who deems it worth while to examine somewhat nearer these sterile-looking tracts, will not return without great satisfaction. The Orange River has forced its way through this mountain range, one of the most elevated in South Africa; awful chasms and precipices, as may be imagined, are in its course, passing through such a high mountain.

The season was rather unfavourable for botanical acquisitions, although the vegetation about the regions of the river is highly interesting and rich. The much needed rains had not commenced till very lately, so that the land but just began to become green. In the shadow of some rocks, leaning over and forming small caverns, adjacent to the river,

were *Leonotis ovata,* in full vigour, and bearing numerous spikes of red flowers; *Samolus campanulatus,* which grows in the rocky channel of the river, with its roots fixed in the narrow fissures of the rock; and *Chascanum pinnatifidum,* on stony hills; also a *Talinum,* in alluvial soil on the bank, with a *Cissampelos* and *Malva,* and *Cyperus sexangularis.* In the shadow of the thickets, and climbing amongst the bushes, I noticed *Coniandra pinnatisecta,* and *Cysticapnos, Cissampelos Capensis,* &c.

We crossed the river in safety, and travelled over a nearly level tract for some hours. Our view, towards the north, was bounded by moderately high hills, till we entered a narrow valley, following a small river called Sanddriftspruit, for more than an hour. The atmosphere being very sultry, assumed the appearance of an approaching thunder-storm, which soon broke forth with great violence. The darkness of the night advanced so quickly, that it was with great toil, over a swampy and trackless field, that we reached the temporary station of an emigrant farmer, in whose neighbourhood we took up our quarters that night. We unyoked the oxen, not aware that our encampment was near the bank of a stream, which is dry, except in heavy rains. It was very dark, and the storm increased, till we soon perceived, by the fearful noise of the water, that we had halted close to a torrent. We were in great fear during that night about our safety; but fortunately, the rain soon ceased, and we escaped danger. We had fine weather the next day, and continued our journey; ascending gradually towards a sloping plain, of a fertile soil, with an apparently luxuriant vegetation, principally *Gramineæ,* the *Saccharineæ, Festuceæ,* and *Agrostideæ,* being the most numerous with regard to specimens; while the *Compositæ, Malvaceæ, Buttneraceæ,* and *Asclepiadeæ,* had the most representative species amongst the *Dicotyledones.* We travelled over an elevated plain of some extent, and caught an extensive view of the country about the Orange River, which we had already left behind us. To the north, lay the district through which the Caledon River takes its course. It is a

tributary of the former, and joins it, not many miles below our present route.

The general character of the country here is almost the same, with regard to vegetation, as the Zuureberg, on the left bank of the Orange River; extensive plains, with a luxuriant herbage in a favourable season, but scantily provided with bushes, bounded in all directions by small hills, with flat, table-shaped tops, principally belonging to the red sandstone formation. There is a very extensive tract of country, seemingly of one formation, being strikingly uniform in climate and vegetation. The former, with respect to moisture and temperature, is very much alike at all seasons, and so are the phenomena of the weather. The atmosphere during winter is clear, very cold, and dry. Summer, from November till March, is the rainy season; the air then is very damp and hot in the forenoon, with heavy and sudden thunder-showers; after which, it clears up towards evening, generally to repeat the same the next morning.

Considering the high elevation of that part of the country, together with the advanced number of degrees of southern latitude, there must be a great difference of temperature between the lower part near the soil, and the higher atmosphere. The air contiguous to the ground becomes considerably heated and dilated by a burning sun, but soon enters into a cool and rarified atmosphere above, where it quickly becomes condensed, which may be the reason for frequent and sudden thunder-showers during the hottest season. The limits of that vast region may be superficially drawn in the following way, to give an idea of its extent. The most southern point of that region falls about 32° 30′ S. lat. and 26° 50′ E. lon., near the Moravian Institution, at Shiloh, in the Tambuki country, where it forms a sharp angle. A natural line of mountain chain, running in an easterly and afterwards north-easterly direction towards Delagoa Bay, constitutes its south-easterly and easterly limit. Turning westward, about S. lat. 25°, almost parallel with the same degree of latitude, over a considerably elevated tract of coun-

try, from which the sources of considerably large rivers rise, descending in opposite directions, like the Vaal River, Hart River, southward, and the N'quatuani, Moriqua, and Limpopo, to the north; when they trend afterwards easterly, and most likely fall into Delagoa Bay. At about 24° E. lon., that line turns again towards south-east, as far as Shiloh, and forms nearly a triangle.

We remained one day near a hill, a short distance from the Caledon River, called "Wolvekop" (Hill of Hyenas); it is conical, and well deserves that name, on account of its occupants. On our ascent towards the top of that hill, for botanical and zoological research, we disturbed several spotted hyenas from their usual resort; they passed unhurt a heavy musket fire, discharged by our men, who ascended to shoot some *Redunca Lalandii*, a kind of antelope, much resembling in habit our chamois, and of which we had seen several from below. They were so fortunate as to shoot a female specimen, and caught her young male fawn alive, which we carefully tended, in order to rear it; but in spite of the utmost attention, it only survived the dam about a week, dying apparently of convulsions.

A fine woody procumbent *Helichrysum* (873), was growing on the hill, its branches entirely covering the horizontal parts of the sandstone rocks, of which that hill is composed, like patches of *Saxifraga* on the Alps, and the numerous white flowers contrasting agreeably with the darker objects which surrounded them. A small *Aponogeton*, with junciform leaves, wafted a sweet odour, peculiar to that genus of aquatics, over the neighbourhood; it was growing close to our camp, in a small pond of rain-water, which supplied us with that necessary fluid.

The *Rhus erosa* (Thunb.), one of the most conspicuous shrubs of this country, occupies the rocky edges of precipices on the hills. A curious cucurbitaceous plant (589), with a woody stem and large yellow flowers, like a *Cucumis* or *Momordica*, the foliage resembling *Vitis quinquefolia*, seems

to prefer the rocky crevices and fissures, climbing like the *Vitis*, on anything that is nearest; the herbaceous shoots die down every winter, whether by the influence of the frost or other reasons; but the woody part remains alive.

(*To be continued.*)

Notes on the Botany of the PYRENEES, *in a Letter addressed to the Editor, by* RICHARD SPRUCE, ESQ.

Bagnères de Bigorre, Hautes Pyrénées,
Jan. 3, 1846.

My dear Sir,

I have been for some months wishing to write to you, but my botanical occupations have been so constant and so all-engrossing, as to leave me no leisure for preparing letters. Besides, I have said to myself, "why write, when I have not time to relate the tenth part of my adventures, and above all, when I cannot speak with decision respecting the one-half of my collection?" Now, however, that I am surrounded by ice and snows, and days suitable for herborization occur few and far between, I have time to reflect on past events, and to study and arrange my immense results.

So very discouraging were the accounts I received previous to leaving England, respecting the *Cryptogamia* of the Pyrenees, that I came out with the determination not to be disappointed if I did not discover a single new species. A French writer goes so far as to assert, "La famille des Mousses n'existe pas dans les Pyrénées;" and a learned compatriot, well known as a Bryologist, and who has himself herborized on these mountains, said to me, "There are no Mosses worth gathering in the Pyrenees." The enthusiastic Ramond, who investigated with much perseverance the Botany and Geology of the Pyrenees, in enumerating the plants which he found on the summit of the Pic du Midi (of which he made no fewer than thirty-five ascents!), observes, respecting the last three of the

six species of Mosses which he there collected, "Détermination douteuse, à cause du mauvais état. . . . . . On ne peut herboriser dans les Pyrénées sans remarquer avec étonnement combien de Mousses se propagent sans jamais fructifier." All this was anything but encouraging; but now, when I can say with certainty, that my collection includes numerous rarities and even several novelties, and that in none of my previous excursions have I gathered Mosses in finer fruit, the modest conclusion at which I can arrive is, that having made Mosses and Hepaticæ the principal objects of research, it was to be expected I should find more of them than any of my predecessors, and that the season has surely proved peculiarly favourable for maturing their fructification. One great reason of the previous want of success has, however, been, that no one appears to have sought at the proper season; and I believe that I have myself collected more Mosses, promising to be new, since the end of autumn, than during all the summer months.

I will now endeavour to give you a detailed account of my wanderings, beginning from the beginning.

I left Paris the day after the Fête du Roi (the 1st of May), furnished with numerous letters to the Botanists of the South of France, by Dr. Montagne and my kind friends in England. I had a cold and dismal ride of forty-four hours from Paris to Bordeaux, during which, I and my fellow-sufferers were allowed to descend only twice, in order to snatch a hasty meal. At Bordeaux, I had letters for MM. Grateloup and Des Moulins; the latter was, unfortunately, absent at his property in the Dordogne, but from the former I received every attention. I examined all the Mosses and Hepaticæ in his herbarium, especially those from the Pyrenees and the centre of Spain; not very numerous, and all common, with the exception of the beautiful *Hypnum aureum*, from Madrid. His *Cryptogamia*, from the environs of Dax, (of which he has published a portion in the "Actes de la Société Linnéenne de Bordeaux"), were more interesting, and included some curious *Marchantiaceæ*. We had planned a short excursion, but the

wretched weather prevented us; I made, however, a promenade in the rain, and gathered *Daltonia heteromalla*, *Orthotrichum tenellum*, *Pterogonium Smithii*, *Hypnum circinnatum*, Wils., and *Collema nigrescens*. In journeying from Bordeaux to Pau, I had calculated on visiting Léon Dufour, at St. Séver, but it was some leagues out of my way, and the long "trajet" from Paris to Bordeaux had left me so much indisposed, that I judged it wiser to proceed direct to Pau. I arrived at the capital of Béarn, in the midst of torrents of rain, and it was not until I had been there two or three days that I caught my first glimpse of the Pyrenees—with what emotions, may be conceived. At length lay outspread before me the glorious mountains I had so often longed to visit, and my ardent gaze would fain have penetrated into the deepest recesses of their valleys and gorges, all of which my imagination peopled with hosts of hitherto-unobserved *Cryptogamiæ!* From no place, out of the Pyrenees, is there so good a view of them, nor one which gives you so accurate an idea of their extent and magnitude, as from Pau. The two Pics du Midi of Béarn and Bigorre form the most conspicuous features of the picture; but the former, usually called the Pic du Midi d'Ossau, is, to my taste, much the finer, and indeed the most picturesque mountain, though not the highest, in the whole Pyrenees. Two circumstances, however, considerably damped my ardour; one was, that owing to the protracted winter, the mountains were yet covered with snow, almost to their bases, and the other, my indifferent health; and my visit to the Pyrenees having been undertaken in the hope of gathering health as well as plants, I determined to remain at Pau until I should be somewhat recruited, and then, if the "temps" permitted, to penetrate into the mountains. I was, perhaps, wrong, for the climate of Pau is villanous in spring; a day of burning heat, the thermometer sometimes at 98°, and not a breath of air stirring, will be followed by one of rain or hail, accompanied by a cold westerly wind. It was precisely these rapid alternations of heat and cold that I had hoped to escape in leaving England, and it is not,

therefore, surprising, that encountering them at Pau, of a still more marked character, the cough, shortness of breath, and other distressing symptoms, which I had brought with me from my native country, should still cling to me; it was not, in fact, until I got into the mountains, that I experienced any amelioration of health.

To return, however, to the Botany of the neighbourhood of Pau, which I investigated diligently under all disadvantages. The Phanerogamous vegetation scarcely differs from that of the West of England and Ireland, and I observed few species that were new to me. One of the most interesting, was the elegant *Phalangium bicolor*, which I found on a heathy tract of ground, called the Landes of Pau, growing in company with *Avena alpina* and *Thorei;* the latter, a fine, reedy-looking plant, with something of the habit of its near ally, A. *elatior* (*Arrhenatherum avenaceum*), but wanting the polygamous flowers and torulose root of that species, and having radical leaves of extraordinary length, with margins that become involute in drying. Near the same place, I found a *Cirsium*, which much puzzled me; it agreed with C. *tuberosum*, All. (C. *bulbosum*, DC.), in every respect but the root, which sent out long creeping suckers, attaining sometimes the length of two feet, and then shooting up into plants which extended themselves in the same way, almost *ad infinitum*, so that a space of an acre of ground was matted with their interwoven roots. I am now pretty well convinced that it is that species, modified by the locality, (soft black mud), for I find that the suckers ("fibres," DC.), which have not attained the surface of the soil, are "renflées vers leur origine," as stated by De Candolle; or rather, as Koch more accurately describes them, "incrassata basi apiceque attenuata." The Gave de Pau furnished a few Alpines, brought down by its waters, and fixed on its banks; amongst these, *Scrophularia canina*, the beautiful *Astragalus Monspessulanus*, two or three *Linarias*, &c. My other acquisitions were *Ranunculus nemorosus*, *Saxifraga hirsuta*, *Trifolium glomeratum*, *Erinus alpinus*, *Orchis laxiflora*, *Serapias Lingua* and *cordi-*

gera (the latter very rare), *Epipactis ensifolia*, some *Euphorbias*, *Phyteumas*, &c.; and before I left Pau, the meadows began to be covered with the showy flowers of *Prunella grandiflora*. In Cryptogamia my collection was much more extensive; but in proceeding to describe it briefly, it is necessary to mention, that for want of sufficient leisure, and at a distance from my books and herbarium, there are many I have not yet ventured to name. The habitats are chiefly old walls, trees, and shady banks; for of rocks, properly so called, there are none, the hills near Pau consisting entirely of the débris of the Pyrenees, and offering conglomeration on a grander scale than I have elsewhere seen it. The deep-wooded ravines which intersect the "coteaux" of Jurançon, so famed for their vineyards, afforded excellently-fruited specimens of *Orthotrichum crispulum*, Hornsch., O. *Ludwigii*, O. *stramineum*, and O. *tenellum*; besides which, I gathered *Fissidens grandifrons* (a plant abundant throughout the Pyrenees in calcareous streams), *Bryum erythrocarpum* and *torquescens*, *Isothecium repens* (*Pterogonium*, auct.), *Trichostomum crispulum*; while the mutilated and decayed stems of chestnut-trees were covered with *Dicranum glaucum*, and *Leucodon sciuroides*, bearing a profusion of fruit, but out of season. In a visit which I paid to Pau, in November last, I secured them both in excellent state. On old walls, at Jurançon and Rontignon, I procured a large stock of *Gymnostomum calcareum*, an interesting Moss, allied to our G. *tenue*, but having a rostrate operculum; *Bryum obconicum* and *atro-purpureum*, the latter, *par excellence*, the *Bryum* of the South of France; for in the whole course of my peregrinations, I do not think I have gathered Br. *cæspititium* above once, and Br. *inclinatum*, or *cernuum*, once or twice! The same walls produced several *Tortulas*, the most abundant being T. *revoluta*, covered with capsules; and one is, perhaps, undescribed, if it be not the *Barbula flavipes* of the *Bryologia Europæa*, of which I have by me a scrap scarcely intelligible. T. *inclinata* was just passing, but I was enabled to decide on its being truly distinct from T. *tortuosa*, which has been doubted by some emi-

nent botanists. The latter plant did not ripen its fruit until six weeks afterwards; but throughout the Pyrenees, nothing can be more abundant, although in England, one so rarely meets with fructified specimens. The *var. terrestris* (as it is called) of *Cinclidotus riparius*, I found growing on stones and the roots of trees, even on the tops of hills! It was in full fruit on the 18th of May, while the aquatic variety I was not able to get in that state until the month of November, a circumstance which induces me to think that the two may possibly be distinct. An interesting *Hypnum*, from Jurançon, is the H. *rigidulum*, of Bruch, which comes near our *Teesdalii*. *Hepaticæ* were not numerous, but I found a very pretty new *Jungermanniæ*, creeping on *Weissia verticillata*; its habit is that of J. *scalaris*, but the leaves are less orbicular and the calyx is bilabiate and slightly exserted. Not having seen the J. *scalariformis* of Nees, I am unable to form an opinion as to its identity with my plant. The Lichens I gathered, included *Parmelia Clementiana*, P. *chrysophthalma*, P. *rubiginosa*, *Sticta limbata*, &c. Near Jurançon there is a *Collema* on the trees, which is quite meteoric; in wet weather, and especially after thunder-storms, it springs up as suddenly as a mushroom, forming globular, tremelloid masses, covered with apothecia. Léon Dufour has observed the same near St. Séver, but has never been able to determine it satisfactorily.

The three last days in May were occupied in an experimental visit to the mountains. Oléron, at the entrance of the Vallée d'Aspe, was the place selected for my *début*, but I was still too early—the rain descended continually, and though the snow was rapidly melting, it was not necessary to mount very high in order to reach it. I was in the field however one whole day, but did not gather what repaid me for the wetting, and my Oléron collection includes only *Cynoglossum pictum*, an *Orobanche*, finely fruited specimens of *Hypnum incurvatum*, some *Brya*, and a few other things of less note.

On my return, I found a letter from Dr. Dufour, containing a very pressing invitation to pass a few days with

him at St. Séver, and stating as an inducement, "La saison et le temps ne vous permettent pas d'aborder au moins d'un mois les Pyrénées." This was so much in accordance with what I had just experienced, that I thought I could not spend my time more profitably than in the company of one of the most distinguished naturalists in France. Accordingly, a few evenings afterwards, I found myself seated in the diligence for Orthez, and the following day I arrived at St. Séver, where I met with a most hospitable reception from Dr. Dufour and his amiable family, and the eight days I passed in their company were certainly as agreeable as any that have followed. Léon Dufour, whom Fries calls "Peregrinator Hispaniæ insignis," is 64 years of age; in person rather tall, his strongly marked features bearing traces of the toils and travels of his earlier years, and also evidencing to a physiognomist a mind accustomed to sustained and profound train of thought. Many years ago, his fame as a Botanist, and especially as a Lichenologist, was pretty generally diffused; but, for the last twenty years, his daily study has been the anatomy and physiology of insects, and his elaborate treatises on these subjects have gained him lasting renown. Botany is, however, still his amusement, and the company of a Botanist gave him apparently as great pleasure as if that had been his sole pursuit. All our time within-doors was passed in examining the mosses and lichens in his herbarium; the former tribe not including any species remarkably interesting, but the latter exceedingly rich, especially in original Friesian and Acharian specimens, and manuscript remarks of those celebrated lichenologists. Even at present there is no one better acquainted with the lichens of the Pyrenees than Dufour, and no guide in those mountains is more familiar with the localities than he, which may be easily believed when it is stated that during more than forty years, he has been in the habit of frequently visiting them. His "renseignemens," except as related to the mosses, have accordingly been of great service to me: but with regard to my favourite plants, though I have met with several persons ready enough to give advice, I have found none who had the slightest idea

of the nature of their habitats, and the few localities I have searched out of compliment to my advisers have been almost uniformly unproductive. Besides our labour in the cabinet, we made some excursions, and one in particular which was very interesting to me. This was into the heart of the Landes, at some leagues from St. Séver, where the soil is entirely composed of loose sand, and covered as far as the eye can reach, with forests of pine, (*Pinus maritima.*) The herbaceous vegetation was here of a character more interesting and peculiar than that of Pau: the grasses were *Avena Thorei*, *Agrostis setacea*,* *Festuca uniglumis*, *Airopsis globosa*, and *Agrostis elegans* of Thore, the two latter certainly equalling in elegance any of the family, but now become excessively scarce. Intermixed with these grew here and there *Adenocarpus parvifolius*, *Arthrolobium ebracteatum*, *Silene bicolor*, and *Lusitanica*, (the latter surely not distinct from our S. *Gallica*), *Arenaria montana*, *Teesdalia nudicaulis*, *Lapsana minima*, and the very pretty *Astrocarpus* (*Reseda*) *sesamoides*; and in moister situations, *Rhynchospora fusca*, *Illecebrum verticillatum*, *Corrigiola littoralis*, *Bartsia viscosa*, *Pinguicula Lusitanica*, &c. Mossy places were numerous, but like our fir-woods in England, containing only few species. The only *Sphagnum* was S. *compactum*, and I was glad to get it in good fruit. I gathered also fruit of *Jungermannia obtusifolia* and *Francisci*. Our promenades on the steep wooded banks of the Adour afforded Cryptogamia in much greater variety; several lichens which my learned companion indicated to me, a pretty *Trichostomum*, which may be Tr. *subulatum* of the Bryol. Europ., a *Funaria* that is probably undescribed, *Hypnum illecebrum*, (which I have this autumn gathered in fruit at Dax), *Barbula canescens*, *Jung. capitata* of Hooker, &c.

After my return from St. Séver, and when I had finished

* I am not certain that my plant is that of Hudson, but it is undoubtedly that of De Candolle, whose specimens (described in the Flore Française) were gathered in precisely the same locality as my own, when enjoying, like myself, the hospitality of Dr. Dufour.

drying my collection, I became impatient to proceed to the mountains. Accordingly, on the 25th of June I took my departure from Pau for the Eaux Bonnes, and from that epoch until the 12th of November, I have relaxed not a moment in my exploration of the most Alpine portions of the chain.

RICHARD SPRUCE.

Remarks on some rare MOSSES *of the Southern Hemisphere; by* W. WILSON, ESQ.

(TABS. III, IV.)

GONIOMITRIUM (Hook. et Wils.): acrocarpum. *Peristomium* nullum. *Calyptra* campanulata, magna, speciosa, 8-costata, junior plicata.

1. Goniomitrium *enerve* (Hook. et Wils.); caule brevissimo simplici, foliis late ovatis concavis enerviis, capsula subsessili globosa, calyptra costis prominentibus. TAB. III. A.

HAB. Swan River, *James Drummond*; on a red soil. n. 6 (a).

Caules gregarii, vix lineares, simplici. Folia laxe imbricata, concava, acuminulata, integerrima, albescentia, siccitate haud contractilia, areolis laxis rhomboideis, perichætialia longiora, conniventia. Vaginula cylindrica. Capsula foliis immersa, subsessilis, rufo-badia, ore subcoarctata. Annulus nullus. Operculum planiusculum. Sporæ luteæ, majusculæ, numerosæ. Calyptra capsulam totam obtegens, albida, membranacea, costis subalaribus. Florescentia monoica, antheridia in perichætii foliis axillaria, clavata, pedicellata, exapophysata.

This Moss has much of the habit and character of *Anictangium repens* (Hook. Musc. Exot. t. 106), but is essentially distinguished by its large-ribbed calyptra, and its considerably smaller sporules and naked axillary antheridia; also by the absence of creeping rhizoma. It is probably annual.

FIG. 1, Plants, *nat. size*; *f.* 2, 3, plants, *magnified*; *f.* 4, calyptra; *f.* 5, 6, capsules and a perichætial leaf; *f.* 7, leaves; *f.* 8, sporules, *magnified*.

2. Goniomitrium *acuminatum* (Hook. et Wils.); caule brevi subsimplici, foliis ovato-lanceolatis longe acuminatis nervosis, capsula longius pedicellata subexserta globosa, calyptra membranacea. TAB. III. B.

HAB. Swan River, *James Drummond*, n. 6 (b); on a blackish soil.

Caules præcedente duplo longiores, speciosiores. Folia longiora, rigidula, laxius imbricata, erecta, minus concava, apice magis attenuata; siccitate contracta, subflexuosa viridia, nervo vix sub apicem evanido, areolis rhomboideis, laxis. Vaginula brevior, oblongo-ovata, seta longior, capsulæ longitudinem adæquans. Capsula, operculum et sporæ præcedentis. Calyptra grandior, magis albescens, costis vix prominulis. Florescentia monoica, ut in præcedente.

Essentially different from G. *enerve*, in the nerved leaves, and readily distinguishable by its pedicellate capsule, as also by the totally different aspect of the foliage, especially when dry. The calyptra is more membranous and glossy.

FIG. 1. Plants, *nat. size*; *f.* 2, single plants, *magnified*; *f.* 3, capsule and perichætial leaves; *f.* 4, 5, calyptræ; *f.* 6, 7, leaves; *f.* 8, vaginula and young calyptra, *magnified.*

3. Anictangium *repens*, (Hooker). Calyptra conica, minima, valde inconspicua, operculi rostellum vix amplectens. Capsula in vaginulam brevissimam sessilis, ore dilatata. Sporæ prægrandes, ferrugineæ. Florescentia monoica: flos masculus nunc gemmiformis, nunc in ramo terminalis, antheridia ovali-oblonga, paraphysibus longioribus immixtis. TAB. IV. A.

The figure here given may be considered as supplementary to that in the "Musci Exotici," Tab. 106.

FIG. 1, Male plants, *nat. size*; *f.* 2, single male plant, *magnified*; *f.* 3, perichætium, capsule and calyptra; *f.* 4, young capsule and calyptra; *f.* 5, male perichætial leaf; *f.* 6, leaves, *magnified.*

4. Zygodon *trichomitrion*, (Hook. et Wils.); caule elongato parce ramoso, foliis patulis subrecurvis flexuosis linearibus obtusiusculis, capsula elliptico-oblonga gymnostoma, operculo subulato, calyptra pilosa. TAB. IV. B.

HAB. On trees in the forest of " Grootvadersbosch," district of Zwellendam, *Mr. Zeyher.*

Caules laxe cæspitosi, unciales et ultra, subdichotome ramosi, inferne radiculis purpureis tomentosi, rami erecti. Folia laxiuscula, siccitate subcrispata, apiculata, carinata, margine subrecurva, apice minute denticulata, luteo-viridia, inferiora fusca, areolis punctiformibus, perichætialia erecta. Vaginula pilosa. Seta semiuncialis. Capsula erecta, ore angustata siccitate plicata, fusco-badia. Annulus nullus. Peristomium nullum. Operculum basi conicum, rostro subulato subobliquo, capsulæ dimidiam æquans vel longius. Calyptra dimidiata, subulata, pilis lutescentibus hirta, capsulæ ¾ obtegens.

Except in the hairy calyptra and subulate operculum, this moss is sufficiently allied to the other species of the genus, especially Z. *viridissimum.*

FIG. 1, Plants, *nat. size; f.* 2, capsule and calyptra; *f.* 3, lid; *f.* 4, 5, leaves, *magnified.*

Contributions to the Botany of SOUTH AMERICA. *By* JOHN MIERS, ESQ., F.R.S. F.L.S.

(*Continued from Vol. IV. p.* 515.)

METTERNICHIA.

This genus was proposed by Dr. Mikan for a beautiful shrub, with large white flowers from the neighbourhood of Rio de Janeiro, and by him dedicated to Prince Metternich, the liberal patron of the many scientific expeditions that have so greatly extended our knowledge of the Natural History of Brazil. It comprises only a single species, of which a very good figure was published by Dr. Mikan in his Delect. Flor. et Faun. Braz. 3, tab. 1, but as that work is extremely scarce, and the details of the seeds not quite perfect, I offer the results of my own observations.

METTERNICHIA, Mik.—*Calyx* campanulatus, tubo inflato,

inæqualiter 4-5-6-fido, laciniis 2-3 sæpe duplo majoribus foliformibus, persistens. *Corolla* hypogyna, infundibuliformis, tubo superne amplo, limbi expansi, æstivatione profunde plicati, laciniis 5, brevibus, æqualibus, crenulato-undulatis. *Stamina* 5, corollæ contractione inserta, inclusa, 2 breviora; *filamenta* filiformia, basi dilatata, imo pubescentes, superne glabra; *antheræ* 2-loculares, basifixæ, longitudinaliter dehiscentes. *Ovarium* sessile, 2-loculare, ovulis in loculis utrinque 8, in septi faciem juxta basin ad nervos 2 parallelos, 2-seriatim dispositis, adscendentibus, imbricatis, inferioribus exterioribus. *Stylus* simplex. *Stigma* 2-lamellatum, laminis, crassiusculis margine revolutis. *Capsula* coriacea, lignosa, cylindracea, 2-locularis, apice septifrage 2-valvis, dissepimento libero, valvis parallelis demum semi-bifidis. *Semina* 2-4 in quoque loculo, e dissepimenti basi adscendentia, longe linearia, utrinque acuminato-attenuata, margine ala membranacea cincta, ventre convexa, dorso carinata, hilo basali, testa chartacea ad endopleuram spongiosam adnata. *Embryo* in axi albuminis carnosi tenui rectus, cotyledonibus linearibus, radiculam cylindricam inferam æquantibus. Arbor *Brasiliensis frondosa,* foliis *alternis breviter petiolatis, ellipticis, penninerviis, valde reticulatis, integerrimis, nitidis,* floribus *terminalibus, subsolitariis, vel plurimis subracemose fasciculatis, ebracteatis, speciosis, albis.*

1. Metternichia *princeps,* Mik. *loc. cit. tab.* 1. Char. ut. supra.—Rio de Janeiro, *v. v.*

This is a handsome tree, or shrub, with copious foliage of bright evergreen leaves and large conspicuous flowers. It is altogether perfectly glabrous. The leaves are about 3-4 inches long, and 1¼ to 1½ in. broad, upon a slender channelled petiole of 4 lines; they are thin, and of a somewhat membranaceous texture, the margin being slightly revolute; they have a reticulated venation, and both surfaces under a strong lens appear minutely punctulated. The calyx is very thin, membranous, light green, very reticulately nerved, and unevenly cleft into 4-5-6 obtuse leaf-like segments of various length; it is generally half an inch, sometimes nearly 1 in.

long. The corolla is white, 2½ in. long, 1 in. broad in the mouth, and 2 in. across the border: the tube is slender at base, for about half an inch, when it suddenly swells into a long and somewhat campanular form, marked with many longitudinal veins: the border is obtusely 5-lobed, and crenulated on the margin, in æstivation it is deeply plicated, the inflected portion being externally covered with soft down, which soon entirely disappears; the stamens are the length of the corolla, the filaments are fixed near the base in the contraction of the tube, which is the only part that is pubescent, they are dilated at the base, and ciliated, but are tapering and glabrous upwards, two of them are somewhat shorter than the others, the anthers are ovate, 2-lobed, somewhat cordate at base, where they are fixed in the sinus to the apex of the filament. The pollen grains are globular, obsoletely 3-gonous, or rather having 3 indistinct mammiform projections at equidistant points, with alternating converging lines. The ovarium is slightly stipitate, obovate, sericeous, 2-celled, with 8 ovules in each cell, arising from the base of the dissepiment, and affixed in 2 series near 2 elevated parallel nerves that extend from the base to the apex of the dissepiment. The style is slender, glabrous, as long as the corolla, the stigma is bilamellated, consisting of two short fleshy lobes, with reflected margins, the inner faces being glutinous and subpapillose. The capsule is 1¼ in. long, 4 lines diameter, supported by the persistent calyx, the valves are thick and coriaceous, each being divided half way down the middle; the dissepiment contracts and becomes free as the seeds ripen, sometimes only two or four of which are perfected in each cell, the entire number being seldom matured. The seeds are linear, winged, with a dorsal keel, which is sometimes double; the endopleura adheres to the lining of the cell, which is filled by the albumen: this is cylindrical, 9 lines long, ¾ line broad, straight, thin, and fleshy, and encloses an embryo of the same form, with semiterete cotyledons of similar thickness, and about the length of the inferior radicle.*

* A figure of this species, exhibiting ample sectional details is given in Plate 14 of the "Illustrations of South American Plants."

From the above description, no doubt can any longer exist as to the true position of *Metternichia*, which has hitherto been considered doubtful. It was placed by Dr. Lindley in *Solaneæ*, near *Solandra:* others have arranged it in *Bignoniaceæ*, and ultimately, on the authority of Fenzl, Dr. Endlicher has doubtfully assigned it a position in the subtribe *Vestieæ*, among *Solanaceæ*. Its true place is certainly next to *Sessea*, with which it agrees in its 2-locular capsule, with the dissepiment parallel to the valves, which are both nearly cleft to the base, in its erect seeds, fixed by their base to the bottom of the dissepiment, and in having a lengthened straight embryo, with linear cotyledons, in which respects it differs from *Vestia*, *Cestrum*, and their congeners. As those two genera exhibit such distinct characters, I propose to arrange them under a separate section, to be called *Metternichieæ*. On examining many of the Solanaceous genera, I have found some among the *Nicotianeæ*, that possess very distinct characters, very closely approaching the *Cestrineæ*, on which account I have ventured to arrange *Fabiana*, and *Nierembergia*, in juxtaposition with them, placing these two genera, because of their capsular fruit, as a separate subtribe, under the name of *Fabianeæ:* as in *Cestrineæ*, they offer, among other features, a bilamellar stigma, and a decidedly stipitate ovarium. I also propose to remove *Vestia* from the *Cestrineæ*, and to place it in *Nicotianeæ*, which subtribe I have arranged in the *Rectembryeæ*, for they mostly present an embryo as straight as that of *Cestrum*, together with similar small ovoid cotyledons. The attachment of the seeds in *Cestrineæ* is by a ventral hilum, but in *Nicotiana*, and *Petunia*, the seeds are quite oval, so that it is impossible to say whether the hilum be ventral or marginal: among the *Curvembryæ*, on the contrary, the seeds are reniform, and compressed, and the hilum always marginal. In a general review of the natural order, *Solanaceæ*, I would therefore propose the following arrangement and division :

SOLANACEÆ.

SUBORDO I. RECTEMBRYEÆ. Embryo fere rectus. Stigma sub 2-lamellatum, intus papulosum. Ovarium sæpissime stipitatum, rarius sessile.

TRIBUS 1. METTERNICHIEÆ. Embryo elongatus, omnino rectus, teres. Capsula 2-locularis, valvis semifissis: semina pauca, triquetra, alata, hilo basali imo dissepimenti affixa.

Embryo cotyledonibus teretibus, radiculam æquantibus . . . . . . 1. *Metternichia.*
" " " " brevioribus . . . . . . 2. *Sessea.*

TRIBUS 2. CESTRINEÆ. Embryo fere rectus, cotyledonibus parvis, ovatis, compressis. Fructus baccatus; semina angulata, hilo ventrali, dissepimenti medio suspensa. Ovarium stipitatum.

Bacca 2-locularis, seminibus paucis . . . . 3. *Cestrum.*

TRIBUS 3. FABIANEÆ. Embryo fere rectus, subteres, cotyledonibus compressis. Fructus capsularis, 2-locularis, valvis a dissepimento demum solutis. Ovarium stipitatum. Stigma 2-lamellatum.

Capsula valvis 2 profunde 2-fidis, marginibus suturalibus . . . . . . 4. *Nierembergia.*
" " apice 2-fidis, " introflexis . . . . . . 5. *Fabiana.*

TRIBUS 4. NICOTIANEÆ. Embryo fere rectus, vel lævissime arcuatus, subteres, cotyledonibus brevibus subclavatis. Capsula 2-locularis, valvis a dissepimento demum solutis. Ovarium sessile, plerumque glandula hypogyna suffultum. Stigma capitato-2-lobum.

Capsula valvis 2 profunde 2-fidis, dehiscentia septifragali . . . . . . 6. *Vestia.*
" " integris " vix septicidali . . . . . 7. *Petunia.*
" " apice 2-fidis, " profunde septicidali, stamina inclusa, corol. regul. . 8. *Nicotiana.*
" " " " " " " " exserta, " irreg. . 9. *Lehmannia.*
" " " " " " " " inclusa, " obliqua . 10. *Sairanthus.*

SUBORDO II. CURVEMBRYEÆ. Embryo in formam semicircularem, annularem, vel spiralem curvatus. Ovarium sessile vel disco insidens. Stigma capitato-2-lobum, rarissime in laciniis 5 divisum. Semina plurima, hilo submarginali.

TRIBUS 5. DATURÆ. Fructus pseudo-4-locularis.

Capsula muricata . . . . 11. *Datura.*
" glabra . . . . 12. *Dictyocalyx.*
Bacca pulposa . . . . 13. *Solandra.*

TRIBUS 6. HYOSCYAMEÆ. Capsula circumscissa.

Operculo 2-loculari . . . . 14. *Hyoscyamus.*
" 4-valvi, mucronato . . . . 15. *Anisodus.*
" 1-loculari . . . . 16. *Scopolia.*

TRIBUS 7. SOLANEÆ. Bacca 2-locularis. Semina reniformia, hilo marginali.

Before concluding these remarks, I will offer some further observations upon the genera constituting the suborder *Rectembryeæ*, among which I have noticed a feature hitherto unobserved, and although not universal among all the genera, it offers in most cases a very decided character; I allude to the position of the ovarium upon a well-marked and distinct columnar support. In *Petunia* and *Nicotiana* the ovarium is sessile upon an annular disc, which surrounds and conceals this support: in *Petunia* this disc is 2-lobed, in *Nicotiana* it is generally 4-lobed. In *Metternichia* it is sessile,* without any glandular appendage. Among those possessing a stipitate ovarium, *Fabiana* has 2 oblong erect free glands, fixed on the column, while in *Vestia* an annular ring invests the stipes and supports the ovarium. In *Nierembergia*, *Sessea*, and *Cestrum*, (including *Habrothamnus*), the column is simple, quite free, and generally without any glandular appendage, or at least one that is not always easily perceptible. In *Sessea*, *Cestrum*, *Vestia*, *Nierembergia*, and *Petunia*, the tube of the corolla is circumscissile, leaving a persistent cupuliform base that, in some cases, nearly incloses the ovarium, a character I have before pointed out, as existing in some of the *Nolanaceæ*.

I have observed also in the *Rectembryeæ*, that the surface of the testa in the seeds affords a variable character: in *Metternichia* and *Sessea*, it is chartaceous; in *Cestrum*, minutely reticulated and favose; in *Vestia*, broadly rugose, with fine transverse striæ; in *Nierembergia*, with polished prominent rugæ; and in *Fabiana*, it is nearly smooth, with almost imperceptible, longitudinal, rugose striæ. In *Petunia* it is divided into large, equal, hexagonal hollows, separated by simple ridges, while in *Nicotiana* these ridges are waving, crenulate, or even sometimes cristate when viewed by a powerful lens.

The pollen grains of *Metternichia* and *Sessea* are spherical, with 3 rounded mammiform equidistant points, and 3 intermediate convergent lines; those of *Cestrum*, *Fabiana* and

* This, however, is only apparently so, as the column is of the same thickness as the ovarium.

Nierembergia resemble each other, being in the shape of a compressed sphere, somewhat 3-gonous, with a mammiform projection at each angle; those of *Nicotiana* and *Petunia* are of a rounded oblong cylindrical form, with 3 longitudinal grooves, that of *Vestia* being similar, only of a nearly spherical shape.

I have endeavoured to detect some generic distinctions between *Cestrum* and *Habrothamnus*; but after careful investigation, I cannot discover any differential characters either in the flower or the seed: the calyx of the latter is similar to that of many species of *Cestrum*; the corolla is of the same form, its lobes having in like manner a conduplicate æstivation, *i. e.* their edges being turned in on each side for about one sixth of their breadth, and adhering to the adjoining lobes by their woolly surfaces; the stamens are quite similar, as is likewise the style and 2-lamellar stigma; the ovarium, in like manner, is supported upon a short and somewhat glandular column, which when the corolla falls, is invested by its induviate base. I have also examined a capsule yet immature, in which, as in *Cestrum*, the seeds are few, rounded externally, angular within, and attached from a ventral hilum to the thickened placentation of the dissepiment, each by a short ligular strap, and we have the authority of Schlectendahl (Linnea, 8, 251) to show, that the form of its embryo enveloped in albumen is straight, with small round flattened cotyledons; characters which are all exactly those of *Cestrum*. In habit, there is certainly a difference that enables us, at a glance, to distinguish the one from the other, but the real amount of difference is confined to the peculiar kind of articulate pubescence, and the crimson colour of the calyx and corolla; but it must be remembered, that several species of *Cestrum* from Central America, present a calyx and corolla of a deep orange colour, bordering on crimson. If pubescence then be the only tangible character, that can hardly be sufficient to maintain *Habrothamnus*, for in such case, those species of *Cestrum* with stellate hairs, especially those that are hardly distinguishable from *Sessea* in external appearance and in

their flowers, ought also to form a distinct genus, which no one would venture to propose: upon the whole, therefore, I would recommend that the genus *Habrothamnus* be suppressed, and its species arranged as a particular section of *Cestrum* under that appellation.*

I may here avail myself of the opportunity of observing that the genus *Laureria* of Schlechtendahl, placed by some authors among the *Nicotianeæ* is beyond doubt, identical with the *Juanulloa* of Ruiz and Pavon: it ought, therefore to be placed among the *Solaneæ*, where also *Marckea* of Richard, and *Nectouxia* of Kunth, should be arranged, as they better agree with many of that tribe in habit, and as nothing is known of the character of their seeds to warrant their being placed among the *Rectembryeæ*.

I have excluded *Dunalia* from the *Cestrineæ* in the above distribution, because nothing is known of the nature of its embryo, and for other reasons before pointed out, (Vol. IV., p. 332.)

In external aspect there is a remarkable resemblance between some species of *Petunia*, *Nierembergia* and *Salpiglossis*, so much so, that several able Botanists have referred such plants to these three different genera; but there exists in the latter, certain decided characters that cannot be confounded with the two former: I do not allude so much to the didynamous stamens, with a fifth sterile filament, as to the more important one of its deeply reniform seeds, and completely annular, and sometimes even spiral embryo, while in the two former genera the embryo is nearly straight. But there is also another well-marked difference in the æstivation of the corolla, a character of the utmost importance,

* The three known species of *Habrothamnus* thus forming a distinct section of *Cestrum* would be arranged as follows:

§ Habrothamnus.

Cestrum fasciculatum (Habrothamnus fasciculatus, Endl.)
——— Benthami. (————— tomentosus, Bth.)
——— Endlicheri. (————— corymbosus, Endl.)

and one that will probably be found to constitute an unerring line of distinction between the *Solanaceæ* and *Scrophularineæ*, orders so closely allied, that our most able Botanists are yet often undecided as to which of the two, certain plants ought to be referred. This is a desideratum of some moment, and one that appears to me worthy of being pursued: it seems to me possible to reconcile all the discrepancies that at first view stand in the way of such a line of demarcation: indeed, there exist many singular analogies between some plants of the *Salpiglossideæ*, and other *Scrophularineous* genera, and some of tribes of the *Solanaceæ* as above defined, which will probably assist us in this inquiry, but I will reserve to a future opportunity the exposition of my sentiments on this subject, in order to have more ample means of examining the characters of these plants, and of availing myself of the assistance that will be afforded by the extensive views, and vast collection of facts, made by the learned author of the monograph of the *Scrophularineæ*, in the forthcoming volume of the Prodromus.

Sessea.

In order to confirm what I have before stated respecting the affinities of *Metternichia*, I will offer a few observations upon the genus *Sessea* of Ruiz and Pavon, two species of which are only recorded, both being well figured by the authors of the Flora Peruviana; but as I have also had an opportunity of examining two other undescribed species existing in the splendid herbarium of Sir William Hooker, and as the characters of the seed have not been yet sufficiently well determined, I venture to propose here an amended definition of the genus and a description of the four species.

Sessea, R. & P. (Char. emend.)—*Calyx* tubulosus, 5-dentatus. *Corolla* hypogyna, infundibuliformi-tubulosa, limbi 5-fidi erecto-patenti laciniis ovatis, æstivatione conduplicatis. *Stamina* 5, tubi medio corollæ inserta, inclusa;

antheræ 2-lobæ, profunde cordatæ, basifixæ, lobis ovatis, longitudinaliter dehiscentibus. *Ovarium* ovatum, breviter stipitatum, cyatho (corollæ reliquo) circumsessum, 2-loculare, ovulis in loculis utrinque, in septi juxta basin 2-serialiter dispositis, adscendentibus, imbricatis, inferioribus exterioribus. *Stylus* simplex. *Stigma* inæqualiter 2-lamellatum, lobo inferiori breviori, subdeflexo, altero erecto. *Capsula* coriacea, cylindrica, subarcuata, calyce stipata, 2-locularis, apice septifrage 2-valvis, dissepimento libero, valvis parallelis, demum semibifidis. *Semina* pauca, imbricata, lineari-oblonga, compressa, margine ala membranacea cincta, ventre convexa, dorso carinata. *Embryo* in axi albuminis carnosi tenui rectus, cotyledonibus linearibus, subcompressis, radiculam cylindraceam inferam medio æquantibus.—Frutices *Peruviani et Nova Granatenses*, foliis *alternis, petiolatis, oblongis, pseudo-stipulatis, integerrimis, infra sæpissime tomentosis*; racemis *terminalibus, paniculatis*, calyce corollaque *sæpius stellato-tomentosis.*

1. Sessea *stipulata,* R. & P. *Flor. Peruv.* 2, 9, *tab.* 115 *b.*—Frutex fœtidus, orgyalis; foliis lanceolatis, acuminatis, cordatis, supra glabriusculis, subtus stellato-tomentosis, ferrugineo-incanis; pseudo-stipulis magnis, auriculæformibus, gibbosis, deciduis, racemis alaribus terminalibusque, pedicellis corymbosis.—Peruvia, *v. s.*—in herb. meo.

The branches are glabrous, compressed, and finely striated. The leaves are about 4½ in. long, 2¼ broad, on a petiole 9 lin. long, channelled and tomentous, the internodes being about 1½ in. apart. The stem of the axile raceme exhibits sometimes a few small leaves, but it is generally bare for the length of 3 inches, when it spreads into a close branching tomentous panicle of flowers; the terminal peduncles are shorter, closer, and more branched, forming a thyrsoid panicle; the pedicels have each a linear, very acute, leaf-like bract, cuneate at base, and tapering into a long slender petiole. The calyx is 3 lin. long, tubular, 5-toothed; the tube of the corolla above the calyx is funnel-shaped, about 7 lin. long, and the border is divided to the mouth into five

equal oblong segments of the length of 2 lines, with deep inflected æstivation; both the calyx and corolla are smooth inside, and are covered on the outside with dense stellate tomentum. The stamens are included, the filaments rise from about the middle of the tube, out of as many prominent longitudinal ridges, which are retrorsely pilose, they are quite smooth above; the anthers are deeply cordate, 2-lobed, fixed on the apex of the filament, the lobes being oval and slightly scabrid. The pollen grains are spherical 3-grooved, with alternating convergent lines. The ovarium is ovate, very sericeous, surmounted on a distinct glabrous stipes, which is surrounded by a short tubular cup, being a persistent portion of the corolla, which here breaks off by a horizontal line as I have described in *Alibrexia*, a feature I find to be apparent in nearly all the species hitherto placed in the *Cestrineæ* that I have examined. The style is columnar, erect, sulcated, slightly but distinctly scabrid in its entire length, and is longer than the corolla; the stigma is bilabiate, the upper lip being erect and longer than the other, which is somewhat declined. The capsule is curved, cylindrical, 4-grooved, about double the length of the persistent calyx, smooth, bursting by four nearly equal fissures that extend half way down. They usually contain two or four seeds in each cell, imbricate in two series; they are oblong, compressed, winged and keeled, much in the same manner as in *Metternichia*, only smaller and broader in proportion; the cavity containing the embryo is about 2 lines long ¾ line broad, the inner membrane remains attached as a lining to the cavity, the albumen, which entirely fills the cell, is thin and fleshy, and encloses an embryo of the same cylindrical shape; this is nearly straight, slightly sigmoid in one direction, and a little curved in the other, the cotyledons are not broader than the radicle, are semiterete and somewhat compressed, and are about half the length of the inferior radicle.*

2. Sessea *dependens*, R. & P., *Flor. Peruv.* 2, 9, *tab.* 116.—

* This species, with details, is shown in Plate 15 of the "Illustrations of South American Plants."

Arbor 5-orgyalis: ramis pendulis: foliis sparsis petiolatis cordato-oblongis, acutis, integerrimis, subtus valde pulverulentis; pseudo-stipulis nullis: racemis longissimis, terminalibus, dependentibus, floribus ternis sessilibus.—Tarma, Peruviæ, *v. s. in Herb. Mus. Brit.*

The specimens collected by Dombey, and Ruiz and Pavon, existing in the British Museum, greatly resemble the figure given in the Flora Peruviana: the stem is flexuose, much compressed, and finally glabrous; the leaves are smooth above, pulverulent beneath, with soft stellate hairs; the capsules are twice the length of those of the former species, and half enclosed in the persistent calyx, which is finally quite glabrous.

3. Sessea *vestita*. *Cestrum vestitum*, Hook. Icon. pl. tab. 381.—Frutex, ramulis compressis demum glabris: foliis oblongis, acutis, basi obtusis, petiolatis, nervis sub 8-jugis, venisque reticulatis superne impressis, supra glabris, subtus petiolis ramulis corymbisque tomento incano vel subfulvo dense vestitis, pilis apice stellatis vel articulatis et plumosis; pseudo-stipulis nullis; corymbis terminalibus densifloris; corollæ tubo gracili fulvo-tomentoso; ovario tomento stellato dense vestito; capsula glabra subincurva.—Nova Granada, *v. s. in Herb. Hooker.* Paramo de Quindiù, (*Goudot.*) Quito, Pichincha et Tambillo, (*Jameson, n.* 185 *et* 67.)

This is described as a tree of middle size, growing at an elevation of about 9000 feet above the level of the sea. The leaves are from $3\frac{1}{2}$ to $4\frac{1}{2}$ in. long, $1\frac{1}{2}$ to 2 in. broad, on a petiole 6 lines in length; they are shining above, quite glabrous, with impressed reticulate veins, which give the older leaves a very rugous appearance. The flowers, peduncles and branchlets are covered with very dense incanous or fulvous down, the hairs of which are stellate at the apex, but on the under side of the leaves, this tomentum consists of hairs composed of many short joints, which are stellate at each articulation, so that they appear elegantly plumose. The corymbs are much branched and densely flowered, the whole being covered with close fulvous

tomentum; the calyx is obconical truncated, with five prominent nervures, and as many almost obsolete teeth, and is 1½ line long; the corolla is 8 lines long, with a very slender funnel-shaped tube, nearly smooth within, the border consists of five short erect lobes, which have a conduplicate æstivation; the stamens arise somewhat below the middle of the tube, are a little geniculate, and slighty pubescent at base, slender, straight, and glabrous above, and recurved at the apex; the anthers are included, with ovate adnate lobes, which are attached at a dorsal point to the apex of the filament. The ovarium is fixed on a distinct glabrous column equal to its own length; it is oval, densely covered with white stellate hairs, and is somewhat umbilicate at the apex, out of which rises a long slender glabrous style, somewhat longer than the stamens; the stigma is 2-lamellate. The capsule is cylindrical, 4-grooved, somewhat incurved, and half invested by the persistent calyx, is 6 lines long and 1 line diameter, splits into two valves, which are 2-fid at the apex; the seeds are small and winged, as in the first described species.

4. Sessea *corymbosa*, (n. sp.)—Frutex, omnino glaberrimus, ramulis subcompressis; foliis approximatis, petiolatis, cuneato-oblongis, supra lucidis, subtus pallidioribus, glandulis minutis creberrimis albis notatis, pinnato-nerviis, nervis primariis divaricatis, 16-20 jugis cum alteris intermediis brevioribus, reticulato-venosis, pseudo-stipulis nullis: racemis corymbosis terminalibus, floribus sessilibus.—Nova Granada, *v. s. in Herb. Hooker*, Bogota ad Barro Blanco, (*Goudot*), S. *corymbosa*, MSS.

This species differs from all the preceding in being wholly free from any pubescence, except externally on the inflected portion of the lobes of the corolla. The leaves are smooth above, of a clear dead green colour; the nerves and reticulated veins are prominent; beneath, they have a somewhat ferrugineous hue, but under a lens the lower surface is very closely covered with minute white glandular raised dots; their length is 5 inches, their breadth 1½ to 2 inches, upon a petiole ¾ in. long, which is thick and rounded below, some-

what flattened above, and of a glaucous hue. The flowers are sessile, and arranged in a branching few-flowered corymb; the calyx is 3 lines long, the corolla 8 lines in length, funnel-shaped, about 2 lines in diameter, with five rather short, erect teeth; the filaments, of unequal length, are fixed below the middle of the tube, have a few recurved hairs at base, but are glabrous above; the ovarium, which rises on a short glandular column, is glabrous, as well as the long, slender, and slightly incurved style; the stigma is somewhat larger, 2-lipped, and inclined; the capsule is shorter and thicker than in the preceding species, being half invested by the persistent calyx, about 6 lines long, 2 lines in diameter, and somewhat curved; there are two seeds matured in each cell, which are broadly winged, with a slender longitudinal keel. The form of the embryo corresponds with that of the first described species.

Cestrum.

During my residence in Rio de Janeiro, I found in its neighbourhood and in the Organ Mountains, several species of *Cestrum*; and as I do not find them recorded, I will here offer a short diagnosis of their characters. In order to explain the views before proposed, in regard to the distribution of the *Rectembryeæ*, and as a term of comparison between this genus and others included in this sub-order, I will first give a somewhat amended character, in accordance with observations made upon several species that I examined in the living state.

Cestrum, Linn. (char. emendat.)—*Calyx* parvus, tubulosus, 5-fidus, vel 5-dentatus, persistens. *Corolla* hypogyna, infundibuliformis, tubo elongato, superne ampliato, limbo 5-partito, patenti vel revoluto, æstivatione conduplicativo. *Stamina* 5, medio corollæ tubo inserta, inclusa, filamentis simplicibus, vel basi dente auctis, antheris longitudinaliter dehiscentibus. *Ovarium* ovatum, breviter stipitatum, stipite vix glanduloso cyatho (corollæ reliquo) circumdato,

2-loculare, dissepimento medio placentifero, ovulis paucis, spermadermis ligulatis suspensis. *Stylus* simplex. *Stigma* sub-2-lobum, vel concavo-capitatum. *Bacca* calyce suffulta, 2-locularis, vel abortu 1-locularis. *Semina* pauca, compressa, dorso rotundata, facie interna angulata, hilo ventrali. *Embryo* in axi albuminis carnosi rectus, cotyledonibus parvis, orbiculatis, compressis, radicula tereti infera.—Frutices *Americæ tropicæ*, foliis *alternis, solitariis rarius geminis, integerrimis, interdum pseudo-stipulatis;* floribus *racemosis*; racemis *bracteatis, axillaribus, elongatis, vel in corymbum, spicam, aut fasciculam abbreviatis;* floribus *sæpe suaveolentibus*, corollis *luteis, rarius viridescenti-albidis, aurantiacis vel rubris*; baccis *nigris aut violascentibus.*

The following are the new species above alluded to.

1. Cestrum *Organense* (n. sp.)—glaberrimum, ramulis teretibus; foliis ellipticis, utrinque acuminatis, submembranaceis, in petiolum basi tumidum subdecurrentibus; racemis axillaribus, floribus subcapitatis, bracteis foliosis magnis oblongis sessilibus, corollæ fere longitudine; staminibus insertione barbatis, edentulis.—Rio de Janeiro, Serra Organensi, *v. v.*

This species approaches *Cestrum bracteatum*, (Link et Otto, Pl. Select. 1. tab. 6. Bot. Mag. 2974), but its leaves are neither lanceolate nor pubescent, nor have they any pseudo-stipules: they are 5 in. long, $1\frac{3}{4}$ broad, on a petiole 6 to 8 lines in length. The peduncles of the racemes are from 2 to 3 in. long: the bracts are 6 lines long, 4 lines broad, with ciliate margins; the calyx is glabrous, tubular, 1 line long, with 5 short, erect, ciliolate teeth: the corolla with a very slender tube, swollen below the mouth, is 9 lines long, with a rotate border, the margins of the lobes externally are tomentous for one-third of their breadth on each side, which are turned in during æstivation, so that they adhere together by these broad woolly surfaces: the included stamens are inserted above the middle of the tube, and arise out of as many tufts of spreading hairs, the anthers are rounded, 2-lobed,

and somewhat scabrid: the pollen is compressed, 3-gonous, with a small rounded lobe at each angle, from which 3 convergent lines meet in the centre: the ovarium is supported upon a short, distinct, but somewhat slender column, which in many species is somewhat glandular, and this is surrounded by the persistent base of the corolla, which invariably breaks off as it falls, by a horizontal line, leaving a cylindrical cup: the ovarium is divided into 2 cells by a dissepiment, which presents in its centre a thickened placentation, and upon this are suspended, by a short ligular strap, upon their ventral faces, a small number of ovaria in each cell: the style is filamentous, glabrous, and of the length of the tube of the corolla: the stigma is capitate, being formed of 2 lamellar lobes, whose inner surfaces are covered with a thick green glutinous exudation: the berry is oval, scarcely fleshy, and each cell presents 4 ripened seeds: these are somewhat obovate, rounded on the outside, and angular on the inner face, a little above the centre of which is the hilum, from which the seed is suspended by its short ligular strap: the testa is of a dark green colour, of very soft texture when fully ripe: the albumen is soft and fleshy, in the centre of which is seen the erect embryo, which is white, and as in most other *Cestrineæ*, lays longitudinally across the hilum, the cotyledons are small, flat, and rounded, two-thirds of the length and twice the breadth of the terete radicle, which points towards the bottom of the seed.*

2. Cestrum *lanceolatum* (n. sp.)—ramulis teretibus virgatis, foliis elongato-lanceolatis, acuminatis, margine subundulatis, revolutis, basi rotundatis, apice mucronatis, utrinque glabris, breviter petiolatis; racemis axillaribus, brevibus, paucifloris.—Rio de Janeiro, Serra Organensi. *v. v.*

The leaves are 4 in. long, 8 lines broad, on a caniculate petiole, 3 lines in length: they have no pseudo-stipules. The racemes are 9 lines long, which I found only in seed: the

* A representation of this species, with detailed sections, is shown in Plate 16, of the "Illustrations of South American Plants."

berry is oblong, contracted below, supported on a calyx apparently but little enlarged, and contains 2 or 3 seeds in each cell; the seeds correspond with those of the last species.

3. Cestrum *collinum* (n. sp.)—ramulis compressis junioribus angulatis, tomentosis: foliis lanceolatis, basi rotundatis, apice acuminatis, apiculatis, supra nitidis, subtus stellato-pulverulentis, petiolatis: paniculis terminalibus, vel racemis axillaribus, abbreviatis, subumbellato-capitatis, pedunculis calycibusque tomentosis, baccis pisiformibus.—Rio de Janeiro, Corcovado. *v. v.*

The leaves of this species are 5 in. long, and $1\frac{1}{4}$ in. broad, on a petiole 5 lines long, which is swollen at base.

4. Cestrum *Corcovadense* (n. sp.)—ramulis teretibus: foliis ellipticis, utrinque sub-attenuatis, glaberrimis, petiolo gracili basi tumido, pseudo-stipulis sessilibus, inæquilateris: racemis axillaribus brevissimis, floribus subcapitatis, staminibus edentulis, inclusis, insertione villosis: baccis pisiformibus.—Rio de Janeiro, Monte Corcovado. *v. v.*

The leaves are of thin texture, with numerous reticulate veins, 8 in. long, $3\frac{3}{4}$ in. broad, on a petiole 1 in. long: the pseudo-stipules are 9 lin. long, 4 lin. broad: the racemes are only 9 lines long, the corolla with a very smooth tube is 9 lines long, the lobes of the border being deeply turned in, where in æstivation the margins adhere by these broad tomentous edges, the stamens are one-third the length of the corolla.

5. Cestrum *mucronatum* (n. sp.)—ramulis sub compressis; foliis petiolatis, exstipulatis, ellipticis, utrinque glabris et viridescentibus, apice valde attenuatis, calloque apiculatis, marginibus subrevolutis et crassioribus; racemis axillaribus, geminis, compositis; baccis oblongis.—Brasiliæ, Prov. Rio de Janeiro, ad Freixal. *v. v.*

The leaves of this species are 4 in. long and $1\frac{1}{4}$ in. broad, on a canicular petiole, 6 lines long; the racemes are from $1\frac{1}{2}$ to $3\frac{1}{2}$ in. long; the calyx is campanular, 5-toothed, with ciliate margins.

6. Cestrum *montanum* (n. sp.)—glaberrimum, ramulis teretibus, virgatis, superne subangulatis; foliis lineari-lanceolatis, valde acuminatis, petiolatis, pseudo-stipulis foliosis; racemis axillaribus, compositis, pedunculo, pedicellisque compressis, apice tumidis, bracteis linearibus, caducissimis, staminibus inclusis, filamentis tenuibus, dente parvo munitis.—Brasilia, in montibus Organensibus. *v. v.*

The leaves are 4½ in. long and 11 lines broad, with 14 pairs of divaricate nervures, on a slender petiole, 6 lin. long; the pseudo-stipules are spathulately ovate, 5 lines long, 3 lin. broad; the racemes are 2 in. long, and the pedicels 3 lines. The calyx is tubular, 1 line long, 5-toothed, with ciliate margins, the tube of the corolla is slender, 8 lin. long, swollen at the mouth, the border is expanded with lanceolate lobes and tomentous plicate edges, the filaments, one-third of its length, being inserted above the middle of the tube; the stigma is cup-shaped, hollow, somewhat 2-lobed, and exserted; the bracts are 2 lin. long, and very soon fall away.

7. Cestrum *coriaceum* (n. sp.)—ramulis teretibus, furfuraceis; foliis lanceolato-ellipticis, coriaceis, superne nitidis, subtus glaucis, rugosis, marginibus subrevolutis, petiolo crasso, caniculato, pseudo-stipulis nullis, floribus paucis axillaribus, vix racemosis, subfasciculatis, bracteis linearibus, staminibus edentulis, inclusis, medio corollæ insertis, filamentis glabris, basi hirsutis.—Minas Geraes Brasiliæ. *v. s. in herb. meo, et Herb. Hooker*, (*Gardner, n.* 1786, *et Claussen.*)

This is very distinct from C. *corymbosum* in its much larger and more coriaceous leaves and longer petiole, in its axillary flowers, in the insertion of the stamens, and other characters. It differs also from C. *laurifolium* in the size of its leaves, and its edentulate stamens. The leaves are very thick and opaque, 9 in. long and 3¾ in. broad, on a petiole 9 lin. long. The peduncle of the raceme is barely 3 lines in length, few-flowered, with linear bracts, 1 line long. The calyx is campanulate, glabrous, 5-toothed, 1½ line long, the

tube of the corolla is funnel-shaped, smooth, 6 lines long, the induplicate margins of the lobes being tomentous in æstivation, but afterwards quite smooth.

Fabiana.

This genus was first proposed by the authors of the Flora Peruv. for a small sea-side shrub of almost ericaceous habit, with erect terminal solitary flowers. Two other species, likewise of Chilean growth, are enumerated in the Botany of Beechy's Voyage; and a fourth is recorded by St. Hilaire, from the southernmost province of Brazil. To these I have now to add a fifth species, which I collected in the Paramillo of Mendoza, in 1825. This genus by most authors has been placed in the sub-tribe *Nicotianeæ*; Lindley, however, in his Introd. Nat. Syst. p. 296, has arranged it in *Cestrineæ*, I believe, on the authority of Bentham; I can fully confirm this disposition, for reasons founded on its carpological characters, (ante, p. 147). Having seen the typical species as well as the plant above alluded to, in the living state, and collected it in seed, I am provided with data sufficient to justify the following reformation of its generic features.

Fabiana, R. et P. *Prod.* 22, *tab.* 34.—*Calyx* tubulosus, inæqualiter quinquefidus, lobis linearibus obtusis persistens. *Corolla* hypogyna, subhypocrateriformis, tubo sensim ampliato, limbo plicato, reflexo, breviter 5-lobo. *Stamina* 5, imo corollæ inserta, inclusa, inæquilonga, apice incurva, antheris cordato-2-lobis, longitudinaliter dehiscentibus. *Ovarium* breviter stipitatum, glandulis 2 hypogynis liberis carnosis munitum, multiovulatum, placentis sub-lamellatis dissepimento adnatis. *Stylus* simplex, apice incrassato-curvatus. *Stigma* 2-lobum, obliquum, lamellis incrassatis. *Capsula* calyce stipata, 2-locularis, septicido-2-valvis, valvibus apice 2-fidis, margine utrinque septiferis, introflexis, columna placentari compressa, libera. *Semina* plurima, minima, ovata, facie interna angulata, hilo ventrali. *Em-*

bryo intra albumen carnosum fere rectus, cotyledonibus oblongis, compressis, radicula infera, tereti, vix latioribus, et duplo brevioribus.—Fruticuli *Austro-Americani, viscosi, vel resinosi*; foliis *alternis, sparsis, vel imbricatis*; pedunculis, *extra-axillaribus, vel terminalibus, solitariis, unifloris.*

1. Fabiana *imbricata*, R. et P. *Flor. Per.* 2. 12, *tab.* 122 c. *Hooker, Icon. Pl. tab.* 340. *Lind. Bot. Reg. n. s.* 12. *tab.* 59. —Chile in paludosis maritimis, vernacule *Pichi. v. v.*
2. Fabiana *viscosa*, Hook. et Arn. *loc. cit.* 36.—Chile ad Barasca, vernacule *Pichinilla.*
3. Fabiana *thymifolia*, St. Hil. *Mem. Mus.* 12, 317, *tab.* 9. *Pl. Remarq. Bres.* 220, *tab.* 20.—Rio Grande do Sul, Braziliæ.
4. Fabiana *denudata* (n. sp.)—fruticosa, resinoso-glutinosa, virgato-ramulosa, ramulis flexuosis angulatis fere aphyllis: foliis valde deciduis, alternis, minimis, lineari-spathulatis, obtusis, carnosis: floribus terminalibus, solitariis, bracteatis, breviter pedunculatis, erectis.—In Andibus Mendocinis (Paramillo). *v. v.*

This is a dry, arid-looking shrub, that I found growing on the Paramillo of Mendoza, in January, 1825; it is about 3 or 4 feet high, almost leafless, with numerous, erect, virgate, very flexuose branchlets, which are angular, resinous, and somewhat glutinous, with internodes about ¼in. apart; the leaves are extremely deciduous, very minute, linear, scarcely more than a line in length, and extremely narrow. The flowers are smaller than those of F. *imbricata*, solitary, erect and terminal, upon the younger branchlets. The calyx is tubular, 3 lines long, with 5 erect linear teeth one third of its length; the corolla is tubular, slender, a little swollen at base, rather funnel-shaped in the mouth, 9 lines long, of a yellowish-white colour, quite glabrous, with a 5-lobed border, the segments being short, rounded, and reflected. The filaments are slender, arising from the base of the corolla, to which they adhere for a short distance, being somewhat dilated at base, they are nearly the length of the tube, 3 being somewhat shorter, they are sud-

denly reflected a little below the apex, and terminate in a short pulvinate connective, to which the 2 anther lobes are attached, these being somewhat divaricate at base. The pollen (like that of *Cestrum organense*), is compressed, trigonous, with a small rounded lobe at each angle, from which 3 convergent lines meet in the centre. The ovarium is obovate, shining, stipitate, and invested at base by a free fleshy disc, consisting of 2 broad lobes, arising from the stipes: (in F. *imbricata* these lobes are narrow, opposite, quite separate, and erect). The style is filiform, as long as the stamens, incurved towards the summit, where it is considerably thickened; the stigma is thick, clavate, oblique, with two rather reflected lamellar lips. The capsule is cylindrical, about 5 lines long, and 1½ line diameter, invested at base by the persistent calyx; it splits into 2 valves, the margins of which are deeply introflected, and the summit of each valve is cleft about one-fourth of its length: the placentary column is placed transversely with the valves, and shows a number of small projections arranged in longitudinal series, which have been the points of attachment of the seeds. The seeds are numerous and small, oval, rounded on the dorsal side, and angular on the ventral face, the hilum being here situated a little above the middle. The embryo placed in the centre of fleshy albumen is linear, almost straight, or very slightly sigmoid, the radicle is terete, with cotyledons one-fourth of its length, which are equal to it in breadth, and slightly compressed.

I may here remark, that the *Fabiana lanuginosa*, Hook. Arn. *Bot. Beechy's Voyage* 35, is the *Dolia vermiculata*, Lindl. (see Vol. 4. p. 502). As the plants collected in that expedition offered no specimen in seed, there was every reason for considering it to be a *Fabiana*, the flower and the habit of which it so much resembles, rather than the type of a new genus among the *Nolanaceæ*.

Nierembergia.

I have already offered some reasons (p. 147) for showing why this genus, hitherto considered as belonging to *Nicotianeæ*,

should be separated from that sub-tribe. Several species are now cultivated in England, so that it is not requisite to enter into any particular details, but it is essential to define the exact limits of this genus, especially as much resemblance exists between several of its species and some kinds of *Petunia* and *Nicotiana*, which often renders it difficult, from mere external form, to determine to which of these three genera they should be referred. It is, however, distinguished by having the divisions of the calyx usually acute and rigid, not foliaceous; the tube of the corolla is usually very elongated, and more slender than in the *Petunoid* section of *Nicotiana*, though it sometimes approaches in form to some of the smaller flowering *Petunias*; the stamens are generally inserted in the mouth of the corolla, rarely in the middle of the tube; but its most prominent characteristic, is that of the peculiar form of the stigma, which is in the shape of an inverted crescent, with its horns curved round in front, embracing the anthers within its grasp; the capsule also differs from that of the two genera above-mentioned, by having its valves scarcely, if at all, introflexed. I have already pointed out the difference in its stipitate ovarium, and in the form of its pollen grains, in which respects, and in its distinctly bilamellar stigma, it affords a close approximation to *Fabiana*. In order to remove the doubts that may exist in regard to the several species of this genus, I will offer a short enumeration of each, with the more striking characters, as far as I have been able to observe them, and will add some new species that I met with in 1825, together with a few others, yet undescribed, that exist in the herbarium of Sir Wm. Hooker; I propose to amend the generic character in accordance with these observations, in the following manner.

NIEREMBERGIA, R. et P.—*Calyx* tubulosus, 10-costatus, semi 5-fidus, laciniis linearibus, subinæqualibus, acuminatis. *Corolla* hypogyna, tubulosa, tubo gracili, elongato, rarius subinfundibuliformi, ore campanulato, limbo amplo, expanso, breviter 5-lobo, lobis rotundatis, æstivatione plicato. *Stamina* 5, corollæ fauci, rarius medio inserta, exserta, raris-

sime inclusa, inæquilonga, circa stylum conniventia; antheris longitudinaliter dehiscentibus, stigmate circumplexis. *Ovarium* breviter stipitatum, 2-loculare, placentis dissepimento adnatis, multiovulatis, cyatho (corollæ reliquo) demum circumdatum. *Stylus* simplex. *Stigma* sublaterale, oblunato-bilamellatum, lamellis reflexis. *Capsula* calyce persistente tecta, 2-locularis, septicide 2-valvis, valvis introflexis demum 2-partitis, dissepimento placentari libero. *Semina* plurima, minima, ovata, facie interna angulata, hilo ventrali. *Embryo* intra albumen carnosum fere rectus, cotyledonibus oblongis, compressis, radicula infera tereti vix latioribus, et longitudine æquantibus.—Herbæ *Austro-Americanæ procumbentes vel radicantes, vix suffruticulosæ,* foliis *alternis solitariis v. geminis integerrimis,* floribus *extra-axillaribus vel oppositifoliis, solitariis, subsessilibus, albis vel violascentibus.*

1. Nierembergia *repens,* R. et P. *Fl. Per.* 2, 13, *tab.* 123 c.—Caule basi repente, ramulis erectis filiformibus; foliis subfasciculatis, oblongis, pilosulis; floribus subsessilibus, calyce curvato, tubuloso, lobis obtusiusculis.—Chile ad Conceptionem.—*v. s. in Herb. Hook.* (*Cuming.* n. 135.)

The leaves in the specimens I have seen are ovate, about 5 lines long, 3 lines broad, on a short petiole of 2 lines, they are thinly covered with short pubescence; the calyx is about 3 lines long, also pubescent; the corolla is white, with a long slender tube, about an inch in length, and a broad campanulate border, nearly 9 lines diameter, divided into 5 rather short, rounded lobes, each of which is marked with 3 purple longitudinal lines, the throat being of a yellowish colour.

2. Nierembergia *spathulata,* H. B. K. *nov. gen. sp.* 3, 8.—Caule lignoso repente, fibrillis tuberoso-nodosis; ramulis erectis filiformibus puberulis; foliis solitariis vel geminis elliptico-spathulatis, longe petiolatis, glabris margine ciliolatis, junioribus lanuginoso-pubescentibus; calyce subsessili curvato, tubuloso, pulverulento-tomentoso, laciniis obtusis.—Nova Granada, ad Santa Fe de Bogota et Loxam; altit. 6-8000 ped. *v. s. in Herb. Hook.* (Bogota, *Goudot.*)

The leaves are nearly glabrous, or slightly ciliolate, the blade elliptic, 6 lines long, 3 lines broad, on a petiole of 6 lines. The calyx is 4 lines long, the tube of the corolla 8 lines long, the border being more tubular and narrower in the mouth than the former species, and much less in diameter.

3. Nierembergia *calycina,* Hook. *Bot. Mag. tab.* 3371.—Caule repente, filiformi, ramulis procumbentibus, foliisque alternis v. geminis, obovatis, petiolatis, hirto-pubescentibus, pilis canis divaricatis; pedunculis solitariis, brevibus, extra-axillaribus; calyce magno, tubuloso-campanulato, laciniis obovatis, foliaceis, expansis; corollæ tubo longissimo.—In Andibus, prope Mendozam. *v. s. in Herb. Hooker.*

This species is very distinct from the two former, the axils are more distant, the leaves generally in pairs, obovate, suddenly acuminate at each end, 9 lines long, 5-6 lines broad, on a short petiole of 2 lines, they are hirsutulate, with long, white, spreading, adpressed hairs; the peduncles 9 to 11 lines long; the calyx about 9 lines long, is tubular at base, for the length of 3 lines, the lobes being broad, foliaceous, obovato-spathulate, slightly apiculate, with a row of long spreading hairs on each side of the mid-rib; the tube of the corolla is extremely slender, 2 inches long, the border broadly campanulate, 1½ in. diameter, with 5 rounded lobes, the throat and tube being of a yellowish hue.

4. Nierembergia *rivularis* (n. sp.)—Caule repente, filiformi, ramulis procumbentibus, foliisque longissime petiolatis, spathulato-ovatis glabris; floribus solitariis subsessilibus, oppositifoliis; calyce curvato, laciniis oblongis, subobtusis, erectis; corollæ tubo valde elongato, glabro.—Buenos Ayres. *v. v.*

I found this plant on the grassy banks of the Rio de la Plata, the prostrate branches creeping among the grass, above which rise its pretty white flowers. The leaves are alternate, more rarely geminate, quite glabrous, the blade is from 9 to 12 lines long, 4 to 6 lines broad, elliptic, somewhat obtuse at summit, cuneate at base, on a slender petiole 1¼ long. The flower is solitary upon a short horizontal peduncle, 1 line

long; the calyx is curved and slightly pubescent, 10-nerved, 4 lines long, with unequal, oblong and somewhat obtuse segments; the corolla is glabrous, with a very slender tube, $2\frac{1}{4}$ inches long, $\frac{1}{4}$ line thick, its border is broadly campanulate, nearly an inch in diameter, with 5 short rounded lobes; the stamens are exserted, fixed in the extreme edge of the tube, quite smooth.

5. Nierembergia *hippomanica* (n. sp.)—*Trav. Chile.* 2, 532.—Planta scabrido-pilosa, caule lignoso, humifuso, radicante; ramulis brevibus adscendentibus; foliis confertis, spathulato-linearibus, acuminatis, calloso-mucronatis; floribus, parvis, subpaniculatis; calyce brevi, 10-carinato, lobis linearibus, patulis; corollæ tubo gracili, brevi, calyce 2-plo longiori, glanduloso-pubescenti, limbo late campanulato, lobis rotundatis.—Provincias Argentinas, vernacule *Chuchu. v. v.*

α. foliis confertis, lanceolato-linearibus, valde approximatis, scabrido-pilosis. In Prov. Cordovæ et San Ludov.

β. foliis glaucis, glabriusculis, brevibus, anguste linearibus. Achiras.

This is a low-growing species, disseminated in certain pasturage districts within the Provinces of San Luiz and Cordova, and is said by the Gauchos to be very poisonous to horses. The root is much thicker, more tortuous and woody than the former species, creeping along the surface of the ground, and throwing up several woody erect branching stems, 4 to 6 inches high, which are clothed with close-set foliage. The leaves are 4 lines long, $\frac{3}{4}$ lin. broad, linear, and spathulate, covered with dense scabrid hairs. The peduncles are 1 line long, the calyx 2 lines, the tube of the corolla 3 to 4 lines long, with a broad campanulate border, 5 lines diameter, and is of a white colour, tinged with a rosy hue.*

6. Nierembergia *ericoides* (n. sp.)—Caule adscendente, ramu-

* A representation of this species is shown in Plate 18 of the "Illustrations of South American Plants."

lis erectis virgatis; foliis brevibus sub-fasciculatis, breviter linearibus, obtusis, carnosulis, scabrido-pilosis, calyce 10-costato, costis hirsutulis.—Banda oriental. (*Tweedie, v. s. in Herb. Hooker*).

This species approaches the last, but is very different in habit, being much branched, with straight virgate stems, and growing to the height of 12 to 18 inches, whereas the other seldom exceeds 3 to 6 inches in height, is tortuous and greatly stunted. The leaves are fasciculate, much more fleshy, more scabrid, and the axils are more diffuse. The flowers are covered with simple, not glandular pubescence, are much larger, and the tube of the corolla is longer in proportion to the calyx; the leaves are sessile, about 3 lin. long, and barely a line broad; the calyx is covered with long hairs, and is 2 to 3 lines long, on a peduncle of 2 lines; the tube of the corolla is 5 lines long, and the broadly campanulate border is from 6 to 8 lines in diameter, and of a white colour; the capsule is small and ovate.

7. Nierembergia *gracilis*, Hook. *Bot. Mag. tab.* 3108. *Sweet. Fl. Gard.* 2 *ser. tab.* 172;—caulibus strictis, erectis, herbaceis, foliisque spathulato-linearibus, pubescentibus, axillis superioribus alternis, inferioribus subverticillatis, internodiis brevibus; floribus in ramulis junioribus terminalibus, calyce tubuloso 10-costato, inter costas membranaceo, laciniis linearibus, obtusis, corollæ tubo calyce multo longiori, limbi campanulati lobis rotundatis. — Bonaria et Prov. Argent. (Pampas.) *v. s. in Herb. Hooker.*

This is a far more erect and slender species than N. *hippomanica*, its stems being of a less woody texture: its leaves are not fasciculate as in the two preceding species, but are simple, very linear, about 7 lines long, and 1 line broad, sometimes smaller. It is a well known plant in our gardens, where, however, its habit is still more slender, its stems weaker, and more prostrate than in its native growth.

8. Nierembergia *filicaulis*, Lindl. *Bot. Reg. tab.* 1649. *Bot. Mag. tab.* 3370. *Sweet. Fl. Gard.* 2 *ser. tab.* 243;—caule herbaceo, erecto, filiformi, ramulis subflexuosis foliisque

lineari-lanceolatis, vagis, glabris; pedunculis oppositifoliis, solitariis, calycis laciniis acuminatis, corollæ tubo gracili calyce vix longiori, filamentisque glanduloso-pubescentibus, limbo magno, campanulato, lilacino, fauce luteo.—Bonaria, *v. s. in Herb. Hooker.* Rio Parana, (*Tweedie*). Entre-Rios, (*Tweedie*) n. 284. Rio Grande do Sul (*Isabelle*).

Its native place is erroneously stated in most botanical works, to be Mexico. The leaves are 12 to 14 lines long, 1½ line broad, somewhat spathulate at base, a little obtuse at summit, with rather distant internodes. The calyx is 10-nerved, the nervures being covered with short pruinose tomentum, is 6 lines long, cleft half way down into 5 subequal, linear, obtuse segments. The tube of the corolla to the extremity of the calyx is slender, above which, for an equal length, it swells into a broadly campanular form, the border about 1½ inch diameter, being expanded and divided for half its breadth into 5 subequal short rounded lobes; it is slightly pubescent outside, of a lilac colour marked with purplish lines.

9. Nierembergia *angustifolia*; HBK. *Nov. Gen.* 3, 9, *tab.* 198:—caulibus herbaceis, cæspitosis, erectiusculis; foliis sessilibus, lineari-lanceolatis, glabris, pedunculis oppositifoliis, solitariis; calycis laciniis longe linearibus, acutis, corollæ tubo elongato, glabro, limbo campanulato, lobis brevissimis, rotundatis.—Mexico.

This species much resembles the last in habit, the leaves 8 lines long, 1 lin. broad, are spathulate at the base. The peduncle is 2 lines, the calyx 5 lines, the tube being scarcely more than 1 line in length, the segments narrow and spreading; the tube of the corolla is 6 lines long, and the white campanular border, 5 lines in diameter. In the figure above quoted, the filaments are represented as united into a tube, and the stigma funnel-shaped, but these are probably errors of the draughtsman, being quite at variance with all the other species.

10. Nierembergia *aristata;* Sweet, *Fl. Gard.* 2 *ser. tab.* 255; glabriuscula, caulibus lignosis, erectis, valde ramosis, gra-

cile filiformibus: foliis spathulato linearibus, obtusiusculis, calloso-mucronatis, calyce urceolato tubuloso, 10-costato, inter costas membranaceis, laciniis æqualibus lanceolato-acuminatis, calloso-aristatis, subpatulis; corollæ tubo gracili, glanduloso-pubescenti, limbo late campanulato, lobis amplis rotundatis; capsula ovata, calyce aucta inclusa.—Provincias Argentinas. *v. v.*

I met with this species at Encrucijada, in the Province of San Luiz, and in Buenos Ayres, in which last place it was also found by Tweedie, from whom the seeds cultivated in England were obtained; from the former locality, the branches are stronger, and more ligneous; but shorter, more branched, and more herbaceous from the latter. The leaves are $\frac{3}{4}$ to 1 inch long, 1 line broad, almost glabrous, the internodes measuring 4 lines: the peduncle is of the length of the axil, 4 lines, opposite the leaf, and flexuosely divaricate with the stem, which is, however, quite straight below; the calyx, almost glabrous, is 4 lines long, cleft half way down into 5 spreading rigid lobes, the tube of the corolla is extremely slender, 6 lines long, the border being about $\frac{5}{8}$ inch diameter, it is white, with longitudinal striated purple lines. The capsule is about 4 lines long and sub-4-valved.

11. Nierembergia *stricta,* (n. sp.) — glabriuscula, caulibus simplicibus, lignosis, erectis, gracillimis, strictis: foliis spathulato-linearibus, acuminatis, calloso-mucronatis, eveniis, utrinque glabris, margine sub-ciliatis: pedunculis oppositifoliis; calyce 10-costato glabro, costis ciliatis, laciniis spathulato-lanceolatis, aristatis, erectis, inæqualibus, tubo 3plo-longioribus, corollæ tubo valde elongato, glanduloso-pubescenti, calyce 3-4plo longiori, limbo late campanulato, lobis brevissimis rotundatis.—Buenos Ayres, *v. s. in herb. meo.*

This plant may be only a variety of N. *aristata,* but it certainly differs from it in having very slender simple stems with more distant internodes, and only 1 or 2 terminal flowers; its calyx has shorter, broader, and more erect segments, and the corolla is larger, with a far more elongated

tube: the leaves are 1 inch to 14, or even 20 lines long, 1½-2 lines broad, the internodes being 5 to 9 lines distant; the peduncle is 3 lines, the calyx 7 lines long, obsoletely 10-ribbed, the segments are 5 lines in length, the space between the ribs not being white and membranaceous as in the former species: the tube of the corolla is extremely slender, 1½-2 in. long, the border measuring 10 lines in diameter.*

12. Nierembergia *rigida* (n. sp.) *Trav. Chile.* 2.532;—glaberrima, caulibus ramosis erectis, valde flexuosis, filiformibus, striatulis: foliis angustissime linearibus, 3-costatis, mucronato-aristatis: pedunculis solitariis, brevibus, oppositifoliis, calyce 10-costato, laciniis linearibus, rigidis, aristatis, tubo 3-plo longioribus; corollæ tubo gracili, pubescenti, limbo late campanulato, lobis rotundatis.—In Prov. Argentinis et Andibus Mendosinis: Rio Negro (Patagonica), *Tweedie, v. v. et s. in herb. Hook.*

I found this very distinct species at Punta de Agua and Achiras, in the Province of Cordova, about 550 miles from Buenos Ayres: it was met with in the Pampas by Dr. Gillies, who also collected it in the Cordillera of Mendoza. The stems, which arise from a long slender ligneous root, are from 6 to 8 inches high, very filiform, extremely flexuose, with internodes 3 lines distant: the very rigid leaves are 15 lines long, not more than one sixth of a line broad, and somewhat falcate and spreading: the peduncle is 3 lines in length; the calyx, 6 or 7 lines long, is furnished with very short and almost glandular white pubescence, the tube being only 2 lines, has 10 very prominent ribs, and 5 rigid linear segments, nearly a line broad, tapering gradually to a sharp point, each 3-nerved: the tube of the corolla is 9 lines long, with a white campanular border, nearly an inch in diameter, having 5 oblong rounded lobes, with purple longitudinal lines; the stamens, fixed in the mouth of the tube, are slightly pubescent.†

* A figure of this species is given in Plate 19 of the "Illustrations of South American Plants."

† This species is represented in Plate 19 of the "Illustrations of South merican Plants."

13. Nierembergia *pinifolia* (n. sp.); — caule adscendente lignoso, inferne denudato, ramulisque delapsu foliorum, cicatricosis, apice foliiferis; foliis imbricato-confertis, erectis, linearibus, 3-costatis, apice mucronatis, calyceque rigido 10-costato glanduloso-pubescentibus; corolla violascenti.—Brasilia meridionali, (Prov. Rio Grande do Sul.) *v. s. in herb. Hooker.*

The leaves are closely imbricated at the summit of the branchlets, nearly erect, and closely imbricated, 11 lines long, $\frac{2}{3}$ line broad, the calyx is 8 lines long, cleft half way down into 5 equal lanceolate rigid segments, the tube of the corolla is scarcely longer than the calyx, and the campanular border $\frac{3}{4}$ inch diameter, of a lilac hue, is marked with longitudinal purple lines.

14. Nierembergia *pulchella* (n. sp.);—caulibus adscendentibus; foliis lineari-lanceolatis, utrinque acutis, margine apiceque incrassatis, subpubescentibus: calyce subinflato, 10-nervi, pilosulo; corolla profunde violacea, puberula, tubo gracili, calyce paulo longiori, limbo late campanulato, staminibus inæqualibus.—Cordillera de los Andes, ora orientali. *v. s. in herb. Hook.* (*Gillies MSS.* N. *pulchella.*)

The leaves are 11 lines long, on a petiole of 2 lines, and $1\frac{1}{2}$ line broad; the calyx is 5 lines long, cleft half way into 5 linear, acuminate, erect segments, it swells in fruit to the length of 7 lines, the tube becoming nearly globular, $2\frac{1}{2}$ lines in diameter, the tube of the corolla is 6 lines in length, the border campanulate, 5 lines in diameter, and of a deep purple colour.

15. Nierembergia *cærulea* (n. sp.);—caulibus adscendentibus, pubescentibus; foliis parvis, anguste linearibus, fere fasciculatis, erectiusculis, falcatis, demum glabris; corolla violacea.—Punta del Sauce, Prov. Cordovæ. *v. s. in herb. Hooker.* (*Gillies MSS.* N. *cærulea.*)

The leaves are 6-7 lines long. $\frac{1}{3}$ lin. broad, the calyx 3 lines long, cleft half way in 5 equal, linear, somewhat reflexed segments, on a peduncle of 2 lines: the tube of the corolla

is slender, 6 lines long, with a border broadly campanulate, 8 lines in diameter, divided into 5 short rounded segments.

16. Nierembergia *pubescens*, Spr.—N. graveolens, *St. Hil. Pl. rem. Bres.* 221, tab. 21, A.—caule lignoso, diffuso: foliis oblongo-linearibus, utrinque acuminatis, glanduloso-pilosiusculis.—Montevideo.

The above figure shows the leaves to be 10 lines long, 2 lines broad, the calyx 7 lines long, cleft half way into 5 lanceolate erect segments, the tube of the corolla 10 lines long and slender, the border broadly campanulate, 6 lines diameter.

17. Nierembergia *linifolia* (n. sp.); —glanduloso-scabrida, caule lignoso, e basi ramuloso, ramis virgatis, rectiusculis; foliis sessilibus, lanceolato-linearibus, apice callosis; pedunculis oppositifoliis, bracteatis, calyce brevi 2-3-plo longioribus; istius lobis linearibus aristatis; corollæ tubo infundibuliformi, limbo parvo expanso, 5-lobo: staminibus inclusis.—In Prov. Argentinis. *v. v.*

α. internodiis longioribus, foliis majoribus pallidis, erectis, floribus subflexuoso racemosis.—Mendosa, *in herb. meo et Hook.* Petunia (*Mendozinensis, Gillies MSS.*)

β. internodiis brevioribus, foliis divaricatis, floribus subsolitariis.—Prov. Cordovæ. *In herb. meo et Hook.* (Nicotiana *linoides, Gillies MSS.*)

Both varieties of this species, which I found in the places quoted, in 1826, bear much the appearance of a *Linum* in habit. It is distinct from all others belonging to the same genus, in the greater length of its peduncle, in its corolla having a much thicker and more infundibuliform tube, with its stamens included altogether within its mouth, and a narrow border cleft to its base, into oblong reflected segments, in which respects it more nearly resembles *Fabiana*. In the var. *α*, the leaves are 4 to 9 lines long, 1 line broad, the internodes 6 to 10 lines distant: in var. *β*. the leaves are 4-6 lines long, ½ to 1 line broad, the internodes 3 lines apart: the peduncle is 7 lines long; the calyx 3 lines, cleft deeply into 5 linear erect segments; the tube of the corolla is 6 lines long,

slender at base, swelling gradually towards the mouth, where it is $1\frac{1}{2}$ line broad, the border only 3 lines in diameter, consisting of 5 short expanded oblong rounded lobes.*

18. Nierembergia *anomala* (n. sp.);—glabriuscula, suffruticulosa: caulibus plurimis ramosis adscendentibus: foliis radicalibus longissime, caulinis breviter petiolatis, oblongo-lanceolatis, utrinque attenuatis, crassiusculis, eveniis, fere glabris, sparse pilosiusculis, junioribus linearibus, floribusque glanduloso-pilosis, pilis sæpissime scabridis patentibus dense tectis; floribus paucis, longe pedunculatis; corollæ tubo infundibuliformi, calyce fere duplo longiori, fauce amplo, limbi 5-fidi lobis parvis rotundatis expansis.—Provincias Argentinas. *v. v.* in Prov. Cordovæ. *v. s. in Herb. Hook.* Prov. Cordovæ (*Gillies, Nicotiana breviflora, MSS.*)—Monte Video et Cordova (*Tweedie, No.* 1122).—Texas ad San Felipe (*Drummond, 3rd Coll.* 245).—Chile ad Quillota (*Bertero. sec. Colla.*)

I first saw this plant in May 1826, at Frayle Muerto and Zanjon in the province of Cordova, at a distance of 360 miles from Buenos Ayres, and it was afterwards found by Gillies and Tweedie in the same province, but their specimens are of more slender growth, the stems more virgate and herbaceous, the leaves more distant, narrower, more pubescent and glaucous than the plants I met with, which in habit closely resemble those collected in Texas. The root is repent, knotty and woody, throwing out several erect shoots at intervals, which are from 6 inches to a foot in height: the radical leaves have a slender petiole as long as the blade, being altogether $2\frac{1}{2}$ inches long, and 4 lines broad, the cauline leaves have a petiole scarcely a line in length, and are from 10 to 16 lines long, about the length of the internodes, and are 2 to 5 lines broad, veinless, erect, and together with the stem, are almost glabrous, the younger leaves and branches are, however, covered more or less densely, with short, rigid, spreading, and glutinous

* A representation of this species is shown in Plate 20 of the "Illustrations of South American Plants."

hairs, the floral leaves being linear, narrow, scarcely more than 4 lines long. The flowers are axillary, the peduncle being 8 lines long, lengthening in fruit to 18 lines: the calyx as well as the peduncle is densely covered with short very spreading rigid hairs, somewhat glutinous, it is 3 lines long, tubular, 10-nerved, and divided half way down into 5 unequal, thickened, linear, obtuse, erect segments; the corolla is of a whitish, sometimes of a yellowish colour, slightly pubescent outside, 5 lines long, quite infundibuliform, marked with 15 longitudinal purplish veins, is enlarged in the mouth, and has a very narrow border of 5 short spreading rounded lobes: the filaments are dilated, fixed in the middle of the tube: the ovarium is oblong and smooth: the style is erect, smooth, as long as the corolla: the stigma is lunulate, or deeply reniform, expanded and embracing the anthers within its encircling rounded lobes: the capsule is smooth, and of the length of the incanescent persistent calyx.*

This plant, it may be presumed, is widely disseminated, for I can discover no difference between the specimens from Texas, and those I found in the Pampas of Buenos Ayres, either in their inflorescence, their leaves, or their habit, except that from the latter place the pubescence is short, rigid, widely spreading, and viscid at the tips, while from the former, it is longer, soft, adpressed, and quite free from glandular viscidity; but this is not sufficient to constitute a specific difference.

The plant collected at Quillota in Chile and described and figured by Colla, (*Memorie di Torino*, 38, 135, *tab.* 45), as my *Petunia viscosa*,† is evidently the same species.

* This species with sectional details is exhibited in Plate 20 of the "Illustrations of South American Plants."

† The plant enumerated by me under this name (Trav. Chile, 2. 531) is that subsequently named by Prof. Graham, *Nicotiana* (Petunioides) *acuminata*.

Species dubia.

19. Nierembergia? *nana.* Nicotiana nana, *Lindl. Hort. Trans.* 6, 92. *Bot. Reg. tab.* 833.—Planta acaulis, cæspitosa; foliis confertis, lanceolatis, longe spathulatis, pilosis, floribus multo longioribus; pedunculis 1 floribus, calyce turbinato, glutinoso-piloso, lobis obtusis, corollæ tubo calyce 2-plo longiori, pilosulo.—Oregon, Rocky Mountains, *v. s. in Herb. Hook.*

This plant in no way resembles any species of *Nicotiana,* and as stated by Dr. Lindley, it is difficult to account for its having been confounded, with *N. multivalvis*; in habit it greatly resembles the four first species of *Nierembergia* above enumerated, but a better knowledge of the structure of its flower, is wanting to point out its true position. The only specimen I have seen, exists in the herbarium of Sir Wm. Hooker, and that is entirely destitute of inflorescence.

Vestia.

This genus consists only of a single well-known species, long since described by many authors, and figured in the Flora Peruviana, under the name of *Periphragmos fœtidus.* I find, however, many of these recorded features at variance with what I have seen, more especially in the figure alluded to, where the structure of the capsule and the seed, is very inaccurately given. The following is an outline of its generic character, according to my own observations.

Vestia Wild. (Char. emendat.)—*Calyx* campanulato-tubulosus, breviter 5-dentatus, dentibus apiculatis, demum auctus et capsulam suffulciens. *Corolla* hypogyna, infundibuliformi-tubulosa, basi demum circumscissa, limbi 5-fidi lobis æqualibus ovatis, æstivatione conduplicatis. *Stamina* 5, paulo supra basin in contractionem corollæ adnata, exserta; *filamenta* e glandula crassa dense barbata orta,

basi dilatata, superne filiformia, glabra; *antheræ* cordatæ, ovatæ, basifixæ, longitudinaliter dehiscentes. *Ovarium* ovatum, breviter stipitatum, disco annulari crenato striato sessum, cyatho persistente (corollæ reliquo) demum clausum, 2-loculare, ovulis plurimis, dissepimento utrinque adnatis. *Stylus* simplex, exsertus. *Stigma* incrassatum, lamellis 2 carnosis agglutinatis. *Capsula* ovata, 2-locularis, 2-valvis, valvis fere 2-fidis, dissepimento demum libero medio placentifero parallelis, incrassato. *Semina* plurima, angulato-ovata, sinu ventrali excavata, hinc supra medium hilo parvo notata, testa tuberculata, striatulis transversis reticulatis signata. *Embryo* in axi albuminis carnosi fere omnino rectus, cotyledonibus 2, rarissime 3, parvis, subcompressis, radicula tereti infera sub-latioribus, et 3-plo brevioribus.—Frutex Chilensis *erectus ramosus*, Cestri *facies*; foliis *alternis, petiolatis, integerrimis, glabris*; floribus *e summis alis subracemosis*, pedicellis *medio articulatis et hinc bractea foliosa decidua instructis, nutantibus*.

1. Vestia *lycioides*, Wild. Cantua ligustrifolia, *Juss*. Cantua fœtida, *Pers*. Periphragmos fœtidus, R. et P. *Flor. Peruv.* 2. 7. *tab.* 132:—foliis obovatis vel lanceolato-ellipticis, basi in petiolum brevem decurrentibus, carnosis, eveniis, glaberrimis; corolla viridi-flava, limbo subviolaceo.—Chile, (Valparaiso et Concepcion.)

This shrub grows in the neighbourhood of the saline lake of Bucalemu, about sixty miles to the southward of Valparaiso, on the opposite side of the river Maypu, where it is called *Porotillos*. It abounds also in Concepcion, where according to Ruiz and Pavon, it is known by the name of *Guevil guevil*. It is much branched, with dense foliage: the leaves being somewhat fleshy, veinless, about 1½—2 inches long, ½ in. broad, tapering into a short petiole, the upper surface is smooth, channelled in the midrib, which is prominent below. The flowers appear on the termination of small branchlets, the pedicel is articulated in the middle, where a small lanceolate leaf-like deciduous bract is seen, and it becomes deflexed, giving a pendent position to the flower.

The calyx is 4 lines long, somewhat campanulate, glabrous, purplish green, with a long woolly apex to each broad short tooth. The corolla is tubular, contracted at base within the calyx, expanding above into a somewhat funnel-shaped tube, of a greenish yellow hue, about $1\frac{1}{4}$ inch long, and 3 lines in diameter, quite glabrous, the border is cleft to the mouth into 5 equal oblong lobes, the margins being broadly conduplicate and tomentous in œstivation, but glabrous when fully expanded: the base of the tube is somewhat pubescent within, thickened, and exhibiting 5 raised fleshy ribs, surmounted by a thick broad gland, which is tufted with long white hairs, from these arise the filaments, dilated at their origin, glabrous, tapering upwards into a slender form, and exserted: the anthers are of a lurid green, deeply cordate, of 2 oval lobes, fixed in the sinus on the apex of the filament. The ovarium is wholly enclosed in the persistent cup-shaped base of the corolla, which here always falls off by a horizontal line: it is supported on a small 5-lobed disc, which is shortly stipitate, and quite free. The capsule is oval, smooth, 10 lines long, 5 lines diameter, supported by the cupuliform enlarged calyx, is divided nearly to the base into 4 valves, the thickened dissepiment becoming free, to which the seeds are attached by a number of projecting fleshy seminiferous plates. The seeds are ovate, somewhat angular, with a ventral excavation, in which the hilum is seen a little above the middle. The testa is tuberculated, with intervening small transverse striæ, and encloses an oval fleshy albumen, in the centre of which the embryo is placed, which is erect and almost straight, but which viewed in front is very little sigmoid, and sideways slightly curved inwards: the radicle is thick and terete, the cotyledons being somewhat broader, slightly compressed and fleshy: I have sometimes found 3 cotyledons: they are about $\frac{1}{4}$ the length of the embryo.*

* A representation of this species with sectional details is given in Plate 21 of the "Illustrations of South American Plants."

Nicotiana.

I have very few observations beyond what has already been remarked upon the well known genus, my chief object being to describe here a new and singular species that I found in Chile in 1822. I will, however, avail myself of the opportunity of tracing an outline of its generic character, in accordance with the views before stated.

Nicotiana, Linn.—*Calyx* tubulosus, semi-5-fidus. *Corolla* hypogyna, infundibuliformis, limbo plicato 5-lobo. *Stamina* 5, inæquilonga corollæ, tubo infra medium inserta, inclusa: *antheræ* longitudinaliter dehiscentes: pollen oblongum, longitudinaliter 3-sulcatum. *Ovarium* sessile, disco annulari obsolete 4-lobo stipatum, 2-loculare, placentis linea dorsali dissepimento adnatis, multiovulatis. *Stylus* simplex. *Stigma* subpattelliforme, intus glandulis 2 magnis instructum. *Capsula* calyce persistente tecta, 2-locularis, imo septicide 2-valvis, valvis demum 2-fidis, placenta centrali denique solutis. *Semina* plurima, minima, oblonga, imo ad faciem ventralem hilo rostrato notata, testa reticulato-foveolata, costis intermediis crenulatis. *Embryo* in axi albuminis carnosi fere rectus, vel leviter incurvus, teres, radicula infera cotyledonibus subclavatis duplo longiori.—Herbæ *interdum* suffrutescentes, *sæpissime glutinoso-pilosæ in America tropica copiosæ, parcius in Asia orientali calidiori crescentes:* foliis *alternis, integerrimis*; floribus *terminalibus, racemosis, aut paniculatis, albidis, virescentibus vel purpurascentibus.*

Nicotiana (Petunioides) *cirrhoides* (n. sp.) Petunia cirrhoides, *Nob. Trav.* 2. p. 531;—herbacea, erecta, glanduloso-viscida, pilisque brevibus articulatis vestita: foliis lanceolatis, basi in petiolum longum attenuatis, margine undulatis, acumine in appendicem gracilem cirrhiformem apice spathulatum attenuatis, summis linearibus longissime et tenuiter apiculatis, floralibus angustissime linearibus: floribus terminalibus paniculatis, calyce campanulato, 5-nervi, denti-

bus 3-angularibus inæqualiter et longissime apiculatis; corolla cylindracea, sordide albida, tubo 15-nervi, subglabro, basi coarctato, calyce 5-plo longiori, limbo fere rotato, obsolete 5-dentato, dentibus angustis longissime cuspidatis. —Chile ad Concon. *v. v.*

This plant which I found in Chile in 1821, bears much analogy to N. *acuminata*, Grah. and is distinguished for the very singular elongation of the midrib of the leaves, and of the nervures of the calyx and corolla. I do not remember the size of the radicular leaves, but those of the stem measure 9 inches, including 1 inch for the petiole, 5 inches for the blade, and 3 inches for its cirrhiform apical extension: they are 9 lines broad with a very undulatory margin, and are covered on both sides (like the remainder of the plant) with short glutinous articulated pubescence, the upper leaves become gradually shorter, narrower and linearly lanceolate with reflected margins, while the floral leaves or bracts are 14 lines long, quite linear and terete, being reduced to a mere slender midrib covered with glutinous pubescence. The panicle is nearly a foot in length, branching at the axil of each flower; each pedicel is about 4 lines long; the somewhat campanular tube of the calyx is 2 lines, and the mucronate teeth are from 2 to 3 lines in length; the corolla is nearly 2 inches long, and barely 3 lines diameter in the mouth, the border is narrow, with 5 short obtuse teeth, having slender cuspidate nerval extensions of 1½ line in length; one of the stamens is shorter than the other 4, which are almost in didynamous pairs, the filaments are slender and glabrous, arising from a little above the base of the tube: the ovarium is glabrous, the style slender, and the stigma has the peculiar form of this genus, the capsule is about 5 lines in length, invested by the persistent calyx, is 2-valved, and in other respects resembles that of the other species of this genus. The seeds are small, roundish, subangular, the hilum being seen on a prominent beak that projects from the lower end of the ventral face, the surface of the testa is divided into

numerous deep hexagonal areoles, separated by crenate undulating ridges, a character more or less conspicuous, and common to the seeds of all the species of this genus that I have examined; the embryo enveloped in copious albumen is cylindrical, the radical which points to the base of the seed, not far from the hilum, is slightly curved at its union with the cotyledons, which are somewhat clavate and half its length.*

I take this opportunity of indicating the suggestion, judging from specimens existing in Sir Wm. Hooker's Herbarium that the *Nicotiana quadrivalvis*, Pursh. and the *N. multivalvis*, Lindl. both from the western coast of America, may belong to the new genus established by Dr. Hooker, under the name of *Dictyocalyx*, upon a plant found by Mr. Darwin in the island of Gallapagos; but they require examination.

The 4th section of *Nicotiana* proposed by G. Don, Dict. 4. 466, in order to comprise the above species, under the title of *Polydiclia* must therefore be suppressed; the other species contained in this section (with what reason I cannot ascertain, as its seed is unknown) is certainly a plant of very opposite character, and appears to me for the reasons given in p. 177 to belong rather to *Nierembergia*. The N. *solanifolia* of Dr. Walpers, placed by him in this division (*Rep. Bot.* 4. 12) has since been referred to the section *Rusticæ*.

PETUNIA.

The limits of this genus, as I have before observed, are not very definite, so that some species by different able botanists have been confounded with *Nicotiana*, *Nierembergia*, and *Salpiglossis*. To *Nicotiana* a near approach is manifest, the most striking distinction being seen in the valves of its capsules, which are entire, while in the former they are cleft half way, or sometimes nearly to the base, but in *Petunia* though

* A figure of this plant with sectional details is represented in Plate 22, of the "Illustrations of South American Plants."

the capsule is generally of more membranaceous texture, notched and entire at the apex, it is sometimes more coriaceous, when by the least pressure, the valves often split as in *Nicotiana*: there is hardly, however, so great an introflexion in the lower portion of the valves. The corolla of *Petunia* is often somewhat oblique, and marked with several branching and reticulate veins on one side, as in *Salpiglossis*, corresponding with the shorter pair of stamens.

In *Nicotiana* the inflorescence is always in terminal panicles, while in *Petunia*, the flowers are invariably axillary and solitary, on a peduncle which is generally deflexed in fruit: the ovarium as in *Nicotiana*, is always supported upon a 2-lobed, not a 4-lobed disc, which conceals the short columnar support: the lobes of the disc correspond with the sutures. The approach to *Salpiglossis** is shown in the didynamous character of its 4 longer stamens, which are inflected towards each other in 2 unequal pairs, while the fifth always shorter, though generally fertile, is sometimes sterile, and is placed between the longer pair. The style is likewise declinate at its apex, and the stigma though it bears much analogy in its structure to that of *Nicotiana*, is doubled into a somewhat bilabiate form. The difference between this genus and *Nierembergia* has been already pointed out (p. 165). The following is offered as an emended generic character.

PETUNIA: Juss. — *Calyx* tubulosus, 10-nervis, 5-partitus, laciniis spathulatis subfoliaceis. *Corolla* hypogyna, infundibuliformis, vel subhypocrateriformis, tubo cylindraceo vel ventricoso, limbo patenti inæqualiter 5-lobo, æstiva-

* I can yet hardly venture to propose the separation of *Lycium* and *Petunia* from the *Solanaceæ*, although more than half persuaded of the propriety of doing so; but if in a more advanced stage of these inquiries, more forcible reasons present themselves, I hope not to incur the charge of inconsistency for this recommendation, and for having in the preceding contributions followed the views of all former botanists in regard to the classification of these two genera in the Natural System. It will be seen, however, from what has been here demonstrated, that *Petunia* is more closely allied to *Salpiglossis* than has been generally supposed; perhaps the *Callibrachoa* of Llarve and Lexarve (which I have not yet seen) will be found to be hardly distinct from *Petunia*.

tione irregulariter obvoluto-conduplicata,* subgibbosa. *Stamina* 5, medio corollæ tubo inserta, inæquilonga, inclusa: *Antheræ* 2-lobæ, imo profunde cordatæ, lobis ovatis longitudinaliter dehiscentibus: *Pollen* oblongum, longitudinaliter 3-sulcatum. *Ovarium* subsessile, disco carnoso sub-2-lobo stipatum, 2-loculare, placentis centralibus dissepimento adnatis, multiovulatis. *Stylus* apice compressus, incrassatus, subincurvus. *Stigma* obliquum, compressum, truncato-2-lobum. *Capsula* calyce persistente testa, 2-locularis, imo septicido-2-valvis, valvis indivisis placenta centrali demum solutis. *Semina* plurima, minuta, subsphærica vel ovata, hilo ventrali, testa reticulato-foveolata, costis intermediis elevatis. *Embryo* in axi albuminis carnosi, apice subcurvatus, radicula infera tereti fere recta cotyledonibus parvis ovatis subcompressis 3-plo longiori.—Suffrutices vel herbæ Austro-Americani *subviscosi*; foliis *alternis, integerrimis, floralibus geminis,* pedunculis *extra-axillaribus, solitariis,* 1-*floris, demum deflexis*; corolla *albida vel violacea.*

1. Petunia *nyctaginiflora,* Juss. *Ann. Mus.* 2. 215. *t.* 47. *f.* 2. —*Bot. Mag. t.* 2552. *Sweet Fl. Gard.* 2. 119. *Tratt. tab.* 72. —Nicotiana axillaris, *Lam. Ill.* 2237;—herbacea diffusa, villoso-glandulosa, viscida: foliis inferioribus alternis, ovato-oblongis, obtusis, pubescentibus, basi in petiolum attenuatis; foliis floralibus sessilibus, cordato-ovatis, oppositis: pedunculis sub 3-floris, folia superantibus: tubo corollæ calycem multo excedente, limbo lato, obtuso.—Rio de la Plata.

This plant is so well known in our gardens, that it is needless to add any particular description.

* A mode of æstivation (as seen in P. *violacea*) to approach near *Salpiglossis*; its definition may perhaps be thus extended, nempe; lobis omnibus medio conduplicatis, plicaturis utrinque versus superiorem torsis, hujusce omnino interioris marginibus in flexuris contiguis utrinque obvolutis, unici lateralis omnino exterioris imbricatis, cæterorum torsive imbricatis et vicissim obvolutis, sed duorum inferiorum dimidiis proximis gibboso-inflatis, inferne voluto-plicatis, superne autem simpliciter imbricatis: this complex mode of æstivation is shown in Plate 24 of the "Illustrations, &c."

2. Petunia *propinqua* (n. sp.);—herbacea, viscido-pilosa, caulibus plurimis prostratis, demum adscendentibus: foliis lanceolatis, acutis, basi in petiolum longum spathulatis, floralibus consimilibus, oppositis: pedunculis solitariis elongatis, calycis laciniis inæqualibus, linearibus, erectis, tubo corollæ calycem multo excedente, limbo campanulato, 5-lobo, lobis brevibus, rotundatis.—Buenos Ayres. *v. v.*

This plant is very near the former, and probably may be only a variety, but it is certainly different in appearance, and in the shape of its floral leaves: it seldom exceeds a foot in height, and is less pubescent, the stems being rounded, and slightly striate: the leaves are smaller, being (inclusive of the lengthened petiole) only 12 lines long and 3 lines broad: the pedicels are 2 inches long, the calyx, 6 lines, divided half way down into 5 unequal, linear, obtuse, erect, and not foliaceous lobes: the tube of the corolla is 2 inches long, slender, cylindrical in the lower portion, funnel-shaped above, swelling into a bell-shaped mouth, the lobes of the border being short and rounded, the whole is of a dull white colour, slightly pubescent, and marked with 5 longitudinal purplish lines: the stamens, which are included, are of unequal length, one being shorter than the rest: the capsule is little more than half the size of that of the former species.

3. Petunia *violacea*, Lindl. *Bot. Reg. tab.* 1626. *Hook. Bot. Mag. t.* 3556. Salpiglossis integrifolia, *Hook. Bot. Mag. t.* 3113. Nierembergia phœnicea, *Sweet. Fl. Gard. 2, t.* 193; —prostrata, pilis viscidis vestita, v. lanuginosa; foliis ovatis, acutis, basi in petiolum attenuatis; floribus axillaribus, pedunculatis; calycis laciniis lineari-spathulatis, obtusis, foliaceis; corollæ magnæ ventricosæ roseo-purpureæ limbo irregulari, lobis ovatis acutis.—Bonaria.

This plant, now so extensively cultivated in our gardens on account of its great beauty, scarcely requires any observation, but it may be remarked, that in the native species the leaves are much smaller than in the cultivated specimens. Several plants in Sir William Hooker's herbarium, collected near the Rio Parana by Tweedie, which appear of the same

species, have leaves not more than 8 lines long by 2 lines broad, while others from the Uruguay have leaves as large as those of our gardens, measuring about 1½ in. long, including the petiole, and 4½ lines broad.

4. Petunia *intermedia*, Don. Nierembergia intermedia, *Grah. Ed. Ph. Journ.* 14, 175, *Sweet Fl. Gard.* 3, *t.* 237. Salpiglossis linearis, *Hook. Bot. Mag. t.* 3256;—herbacea, prostrata, pilis glanduloso-viscidis undique tecta; foliis linearibus, obtusis, dense pubescentibus; corollæ tubo vix calyce longiori, luteo, striato, fauce ventricoso, limbi laciniis emarginatis, puniceis; stylo clavato; capsula costata.—Bonaria.—*v. s. in herb. Hooker.*

The leaves are from 4 to 8 lines in length, 1 line broad, and somewhat spathulate at base.

5. Petunia *elegans* (n. sp.);—suffruticosa, pilis articulatis viscidis undique dense tecta: caulibus adscendentibus, delapsu foliolum basi cicatrisatis, ramosis, superne foliosis; foliis confertis, linearibus, obtusis, margine revolutis, subtus canescentibus, in petiolum brevissimum cito angustatis, demum deflexis; floribus axillaribus pedunculatis, corollæ roseæ tubo ventricoso calycem 3-plo excedente.—Minas Geraes, Brasiliæ.—*v. s. in herb. meo et Hook.*

var. *β.* ramis erectis, elatioribus, virgatis, foliis erectis, adpressis.—Minas Geraes, (*Claussen*) *in herb. Hook.*

This is a very distinct species, the stem and branches being decidedly woody and of hard texture; the leaves are from 6 to 10 lines long, 1-1½ line broad, densely covered with short viscid pubescence, which is incanescently tomentous beneath. The peduncles are 6 lines long, and become deflexed on the fall of the corolla: the calyx is 3-4 lines long, cleft into 5 unequal linear obtuse teeth; the corolla is about 9 lines long, 6 lines broad across the mouth, the tube being contracted below, where it is yellowish, above it is funnel-shaped and ventricose, of a deep rose colour, and veined, the border being divided into 5 ovate rounded lobes; the stamens are unequal, 4 of the anthers approximate in didynamous pairs, while the fifth is intermediate between the longer pair, and is much shorter: the ovarium is obovate

smooth, the supporting column being enveloped by a fleshy annular 2-lobed disc, which invests the base of the ovarium: the style is compressed, 2-grooved, and declinate at summit; the stigma is flattened, truncated, somewhat tubular, with an erect edge, containing within its cavity 2 globular, papillose, viscid glands. The capsule is small, obovate, smooth, and enclosed within the persistent calyx, 2-celled, 2-valved, each valve being entire, notched at the apex, with sutural, scarcely introflexed margins. The seeds are oblong, rounded, with the hilum on its ventral face, dark brown, reticulately areolar; the embryo, enclosed in fleshy albumen, is terete, and slightly curved at the junction of the cotyledons with the radicle, the latter being twice the length of the former, which are slightly compressed, somewhat broader, and ovate.*

6. Petunia *parviflora*, Juss. *Ann. Mus.* 2, 216, *t.* 47, *f.* 1. Nicotiana parviflora, *Lehm. Gen. Nicot. Mon.* 20. Lindernia Montevidensis, *Spr. Syst.* 2, 769;—herbacea, prostrata, villoso-glandulosa, viscida, radice humifusa, caulibus plurimis ramosis; foliis subfasciculatis, lineari-oblongis, obtusis, crassiusculis; pedunculo brevissimo; calycis laciniis inæqualibus, spathulatis; corollæ tubo calycem fere duplo excedente, fauce intus prominente, limbi segmentis obtusis.—Bonaria. *v. v.*

I found this plant growing in moist places in the neighbourhood of Buenos Ayres; its root is suffruticose, spreading into many branching prostrate stems, which are of purplish hue, rugous and spreading at the axils; the leaves are often fasciculate, linear, obtuse, spathulate, rather fleshy and veinless, covered with many rugous tubercles, and beset with short, close, downy, viscid hairs; they are 4 to 6 lines long, and 1 line broad; a fleshy, raised gland is seen on each side of the petiole in the usual place of stipules; the peduncle is short, axillary, 1 line long; the calyx is 3 lines in length, and cleft nearly to the base into 5 unequal, spathulate, obtuse, erect

* A representation of this species is given in Plate 24 of the "Illustrations of South American Plants."

segments, which are fleshy and covered with glandular hairs; the tube of the corolla is nearly cylindrical, 5 lines long, yellow, and marked outside with 5 purplish lines, the border is cleft into 5 rather equal roundish segments, each with a purplish central line and a mucronulate apex, it is of a lilac colour, and somewhat oblique, the upper lobe being more erect, and the lower ones somewhat more reflected, the throat, of a deep lilac hue, is compressed and hollowed inward on the front side, in a somewhat personate form; the stamens are unequal, the 5 filaments arising from the contraction above the base of the tube, are white and compressed, the short sterile stamen is seen below the ringent compression of the tube, between the front and longer pair, while the upper pair is somewhat shorter, the fertile anthers, which approach each other by the inflection of the filaments, are 2-celled, ovate, the 5th sterile one being smaller, erect and castrate. The ovarium is oblong and smooth, 2-celled, laterally grooved on each side, and seated on a somewhat 2-lobed, annular, fleshy disc, the lobes corresponding with the grooves and the edges of the dissepiment; the style is slender, greenish, 2-grooved and compressed at the summit, where it is deflected towards the upper pair of anthers in the mouth of the tube, the stigma is somewhat clavate, or rather 2-labiate, with a thin expanded margin, enclosing 2 large papillose viscid glands. The capsule is small, obovate, smooth, enclosed within the persistent calyx, 2-celled, 2-valved, with a notch in the apex of each valve, where it splits half way down by pressure. The seeds are attached by a point on their ventral face to the thickened portion of the dissepiment that becomes free and is parallel with the valves: they are numerous, light brown, and oval, the surface being divided into rather large, deep areoles, separated by straight prominent ridges. The embryo is cylindrical, slightly curved, the radicle is somewhat thick in proportion to its length, the cotyledons, scarcely broader than the radicle and half its length, are somewhat compressed and ovate.*

* A figure of this species, with sectional details, is represented in Plate 23 of the "Illustrations of South American Plants."

7. Petunia *ovalifolia* (n. sp.);—suffruticosa, subglabra; foliis obovatis, erectis, utrinque scabrido-punctatis, margine scabrido-ciliatis, sessilibus, rachi prominenti basi valde tumido, supra venis impressis, subtus evanidis; pauciflora, pedunculo axillari folio dimidio longiore, corollæ tubo calycem 5-partitum vix excedente, limbo expanso dense purpureo-interdum pallidiori, lobis ovalibus emarginatis.—Rio de la Plata et Brasilia meridionali.—*v. s. in herb. Hooker.* Banda oriental ad Coloniam, (*Tweedie, n.* 286). Viamonte, Prov. Rio Grande, (*rupibus siccis, Tweedie, n.* 287). Rio Grande, (*Isabelle*).

This is a plant differing in its aspect from all other species, it has a woody repent root, with erect branches about 6 inches in height, the internodes being shorter than the leaves, which are sessile, erect, cuneately ovate, 7 lines long, and nearly 4 lines broad, the midrib is prominent below, terminating on the stem in a tumid pulvinate swelling, they are covered on both sides with short, rigid, spreading pubescence, the margins ciliate; the pubescence of the peduncle and calyx is similar, but often terminating in a viscid gland; the peduncle is 9 lines long, the calyx 5 lines, cleft half-way into 5 angular, somewhat oblong and obtuse segments; the tube of the corolla is 6 lines long, swelling towards the mouth, with a broad spreading border nearly ¾ of an inch in diameter, divided into 5 oblong emarginate lobes of a deepish purple colour: the capsule is smooth, obovate, shorter than the persistent calyx that encloses it, the valves being entire, with a notch in the apex of each.*

8. Petunia *viscidula.*—Nierembergia viscidula, *HBK.* 7, 205; —herbacea, procumbens, tenuissime viscidulo-hirtella, foliis subsessilibus, lanceolatis, vel oblongo-spathulatis; floribus solitariis, axillaribus, breviter pedunculatis, corollæ tubo calycem laciniis foliaceis spathulatis subæquante.—Mexico, *in hort. cult.*

Nothing seems to be known of this plant beyond the

* A figure of this plant is given in Plate 24 of the "Illustrations of South American Plants."

description of Prof. Kunth above referred to, from which it evidently appears to belong to this genus, rather than to *Nierembergia.* The branches are prostrate, about 1 foot long; the leaves are somewhat thick and membranaceous, 6 to 7 lines long, and 1½ to 2½ lines broad; the peduncles are 1 line long, viscidly pubescent; the calyx has a short tube, with obtuse, lanceolately spathulate, unequal, spreading segments: the corolla, of a bluish colour, has a funnel-shaped tube as long as the calyx, pubescent, its limb with 5 roundish lobes: the stamens are unequal, included; the ovarium is supported by a small annular disc; the style is filiform, slightly bent, as long as the stamens; the stigma 2-lobed and papillose: the capsule, enveloped by the persistent calyx, is 2 lines long, with 2 entire sub-membranaceous valves: the seeds are minute, angular, reticulate, with a 2-lobed embryo enclosed in copious albumen.*

Steudel states that *Nierembergia graveolens,* of St. Hilaire, which is the *N. pubescens* of Sprengel, is identical with this species; but their descriptions do not accord.

Description of a New Species of BOLIVARIA, *by* GEORGE BENTHAM, ESQ.

TAB. V.

Bolivaria *robusta*; glabra, ramulis brevibus crassis rigidis, foliis paucis minimis oblongis integerrimis, calyce breviter 5-6-dentato, corolla calyce quadruplo longiore 5-6-lobo.

HAB. In Patagonia, *Middleton.*

* Since the above was in type, it has been kindly suggested to me by Mr. Bentham, that this species is probably identical with the *Callibrachoa procumbens,* Ll. and Lex., the *Salpiglossis sinuata,* Hook. Arn. I am glad to find what I hinted in regard to this plant (See note, p. 183), thus soon confirmed by so learned an authority: all the information I could glean on the subject, was derived from the short generic character, published in Walp. Rep. 3.958, its specific details being omitted in the Enumeration in p. 178 of that work. On stating my impression to Sir W. Hooker, he kindly took much trouble to search for his Californian specimens, but in vain, as unfortunately they had been misplaced in his

Frustula adsunt vix 3-pollicaria, corymboso-ramosissima, undique glaberrima. Ramuli oppositi, crassi, rigidi, teretes v. superiores obscure compresso-tetragoni, ultimi conici. Folia stricte opposita, lineâ transversali juncta, 1-2 lin. longa, sessilia, basi erecta, apice recurvo-patentia, obtusa, integerrima, crassa. Inflorescentia cymoso-corymbosa, terminalis, centrifuga. Calyces intra foliorum paria terminalia sessiles, solitarii, ebracteati nisi foliorum par ultimum pro bracteis haberes, 2 lin. longi, campanulati, obscure costati, crassiusculi, glabri, dentibus brevissimis distantibus recurvo-patentibus. Corolla 9 lin. longa, glabra; tubus basi tenuis, breviter exsertus, mox in faucem campanulatam expansus; limbi laciniæ 5 v. 6, ovatæ, patentes, per æstivationem imbricatæ, una exteriore, una interiore, v. rarius 2 exterioribus. Stamina 2 prope basin tubi sive ullâ cum lobis ratione inserta, sed cum ovarii lobis alternare videntur, corollæ lobis paullo breviora; filamenta glabra v. imâ basi pilis paucis barbato; antheræ oblongæ, loculis adnatis parallelis rimâ longitudinali dehiscentibus. Ovarium sessile, depresso-globosum, breviter et crasse bilobum, axi carnosâ, loculis 2. Ovula in quoque loculo 2, loculum implentia, ex axi centrali horizontalia, potius suprapositа quam collateralia. Fructus junior didymus, potius *Bolivariæ* quam *Menodoræ*, dehiscentia tamen ignota.

This curious species formed part of a collection of about 400, made in Patagonia by Captain Middleton towards the close of the last century, and presented by him to the late Mr. William Forsyth, whose herbarium came into my possession. The exact stations are not given, but they were generally stated to be either from Port Desire, or other ports to the southward.

I take this opportunity of observing, that according to the limitations of the genera *Menodora* and *Bolivaria*, now fixed by De Candolle, (Prodr. v. 8, p. 315), the *Menodora Africana*, Hook. Ic. Pl. t. 586, should be transferred to *Bolivaria*.

On KONIGA INTERMEDIA, *of the Canary Islands; by* P. B. WEBB, ESQ.

With a Plate, TAB. VI.—(*by mistake entitled* K. Brunonis.)

KONIGA INTERMEDIA, Webb.

Caulibus elongatis pedicellis gracilibus, loculis 1-2 spermis. (TAB. VI.)

Lobularia intermedia, *Webb. Can. Bot. p.* 92.

Alyssum maritimum β. Canariense, *De Cand. Syst. Veget.* 2, *p.* 319, *Prod. v.* 1, *p.* 164.

HAB. In convallibus, et rupestribus insularum Canariensium frequens.

OBS. Si priorum (K. *Lybicæ,* nobis, et K. *maritimæ,* Br.) alteristri jungenda esset L. *intermedia,* plantaque variabilis, neutrique abnormis, diù incerti hæsimus. A L. *maritimæ,* cui magis affinis, habitu majore, caulibus elongatis, loculisque dispermis, in primis differt. Flores, ut in L. *Lybicæ,* omnino inodori. In genere ergo, quale hoc concepit acumen Brownianum, tam vere concinno, est fructibus ignotis, ipsæ confunderentur species antiquæ, cum præsertim nullis herbariis specimina europæa L. *maritimæ,* aut africana *Fontanesii,* aut syriaca *Billardieri,* nec nostra sicula et melitensia, disperma vidimus, pro specie, inter ambas collocanda, Canariensi, distinctaque habemus.

This is a diffuse shrub, with leaves more or less sericeo-pubescent, but when cultivated, green.

There is in M. Borgeau's forthcoming collections of Canary Island Plants, another species called by me K. *Brunonis,* a stiffer, erect, narrow-leaved plant, which is probably that alluded to by Brown in his Appendix to Clapperton as a species or variety of *Koniga,* from Teneriffe.

TAB. VI.—FIG. 1. Flower; *f.* 2. stamens, pistil and hypogynous glands.

On a New Fern *from* Java, *detected by* Mr. Thos. Lobb.

(Tabs. VII. VIII.)

Among a rich collection of Plants lately presented to me by James Veitch, Esq. of the Nursery, Exeter, from Java, I find a splendid new species of an Acrosticoid Fern, of the genus *Gymnopteris*, Bernhardi, which I thus designate:

Gymnopteris Vespertilio.

Caudice repente fulvo-hirsutissimo, fronde longe stipitata, sterili basi subrotundo-cordata superne biloba lobis divaricatis acuminatis plurinerviis, fertili anguste lanceolata acuminata 4-5 venia venis lateralibus marginantibus, capsulis luteis totam paginam inferiorem (nervis exceptis) obtegentibus. (Tab. VII. VIII.)

Hab. Mountains in Java, *Thos. Lobb.*

Caudex (seu rhizoma) repens, ut videtur, brevis, crassus, villis copiosis oblongis sericeis fulvis tectus. Frondes plurimæ (fertiles et steriles) ex eodem caudice, longe stipitatæ; steriles subspithameæ longæ et latæ, coriaceo-membranaceæ, virides, inferne subrotundo-cordatæ, superne profunde usque ad medium bilobæ, lobis magis minusve divaricatis, acuminatis, non raro inæqualibus, pluriveniis sinu obtuso: venis primariis 5-6 in singulo lobo, parallelis, flexuosis, secundariis tertiariisque reticulatis, ultimis divaricatim ramosis, ramulis liberis apice punctato-clavatis:—Fertiles 7-9-pollicares, lanceolatæ, basi attenuatæ, superne longe acuminatæ, 4-5 veniæ, venis (primariis nempe) parallelis, rectis, strictis, lateralibus marginantibus, reliquis ut in fronde sterili, sed areolis valde elongatis. Capsulæ pallidæ, fulvæ, totam paginam inferiorem frondis (venis primariis exceptis) tegentibus. Stipes sesquipedalis, semiteres, subherbaceus, in frondem sterilem superne dilatatus, canaliculatus.

This is, I have every reason to believe, a perfectly un-

described species of that group of the Linnæan genus *Acrostichum*, to which Bernhardi gave the name of *Gymnopteris*, in which he is followed by Presl and Mr. John Smith, a genus characterized by the peculiar venation, shown in our figure 1, and holding the same position in *Acrostichum*, Linn. that *Drymaria*, Bory. (*Phymatodes*, Br.) does in *Polypodium*. The resemblance of the sterile fronds to the wings of a Bat suggested the specific name:—the fertile fronds are quite different, narrow and lanceolate, with 4 or 5 stout, straight, parallel, primary veins, clothed on the under side, except upon the veins, with pale fulvous-coloured capsules.

Fig. 1. Portion of the sterile frond, *magnified*.

BOTANICAL INFORMATION.

Lindley's *Vegetable Kingdom*.

We change the press at this moment for the purpose of briefly noticing a work of which a copy is in our possession, and of which it is not too much to say that none more important to the student of Botany has ever appeared, for to the proficient in that branch of study, it contains an immense mass of useful information, we mean the "*Vegetable Kingdom, or the Structure, Classification and Uses of Plants, illustrated upon the Natural System, with upwards of* 500 *illustrations, by Dr. Lindley.*" We have not the time, nor is it the object of the present Journal, to enter into a criticism of a work of this kind; we prefer calling attention to a book of such standard character, and which we are sure must soon be in the hands of every Botanist capable of reading the English language. After an accustomed hit at the unfortunate Linnæaus, the author, in an able Preface, dwells upon the vast importance of the Natural System, (of which too much cannot be said in its favour, though the difficulties attending the study of it, at least upon an extended scale, are

perhaps much underrated), and then proceeds to a brief general plan of the work. "Its object is to give a concise view of the state of Systematical Botany at the present day, to show the relation, or supposed relation, of one group of plants to another, to explain their geographical distribution, and to point out the various uses to which the species are applied in different countries. The names of all known Genera, with their synonyms, are given under each Natural Order, the numbers of the Genera and Species are, in every case, computed from what seems to be the best authority, and complete Indices of the multitudes of names embodied in the work are added, so as to enable a Botanist to know immediately under what Natural Order a given Genus is stationed, or what the uses are to which any species has been applied. Finally, the work is copiously illustrated by wood and glyphographic cuts, and, for the convenience of students, an artificial Analysis of the System is placed at the end. Some of these points demanda few words of comment. In the succeeding pages the author first takes certain characters common to very extensive assemblages of plants, by means of which *Classes* have been constituted, and secondly, of breaking up those Classes into minor groups called *Alliances*, whose common characters are also more extensive than those of Natural Orders, and under which the *Natural Orders* are themselves assembled. Very short characters have been proposed, under the name of *Diagnoses*, for both Alliances and Orders; these are intended to express the prevailing tendency observable in each group, but not to include casual exceptions, for which the reader is referred to the descriptions immediately following the Diagnosis.—The serious fault committed in the author's former work, of founding Alliances upon simple Natural Orders, has been avoided in every case except that of Palms, which in reality seem to form an Alliance by themselves. The name Alliance has been preserved in preference to that of class, family, circle, cohort, &c., because it is not susceptible of two interpretations as is the case with all the others; it is employed as an equi-

valent for the Latin term *nixus*, which some have imagined was a misprint for *nexus;* but which was used in the sense of Cicero, and intended to express a tendency to assume some particular form of structure. If any one should inquire why no synonyms have been quoted to these Alliances, concerning which so many Botanists have lately occupied themselves, the Author's answer is, that they have been much too little agreed upon, except in a few very especial cases, and that an examination of their history, would involve an inquiry which must extend back to the *Anthemides* of Cæsalpinus, and which belongs to the History of Systematical Botany rather than to its actual condition. In pointing out the affinities of plants the opinions of the most judicious systematists have been consulted. In addition to the short discussion upon this subject which always follows the paragraph descriptive of a Natural Order, there is appended to the list of Genera a plan of indicating, affinity now adopted for the first time. It consists of printing the name of the Order under discussion in capital letters, placing right and left of it, in small Roman letters, the names of those Orders which are supposed to be in near alliance to it, and above and below it, in Italic type, the names of such as are only analogous, or at least have a greater affinity.—The uses to which plants are applied has been examined with great care, and principally re-written. This part was originally intended as a mere sketch of so vast and important a subject, and, in truth, it is little more even now.—In forming the lists of Genera, the author is called upon to acknowledge the great assistance that he has derived from those of Professor Endlicher, which indeed he has ventured to take as the foundation of his own, making, however, considerable additions and material changes in some, and entirely re-writing others; in this troublesome but necessary task he has been most essentially assisted by the Rev. M. J. Berkeley, who furnished the list of Fungals, and by Mr. Bentham, to whom he is indebted for those of Leguminous and Labiate plants and Figworts.—The illustrations are partly original, partly derived

from other authorities. It would have been more useful if a larger number could have been introduced; but costly embellishments are not possible beyond a certain limit. Finally, the artificial analysis of Orders given in former editions has again been improved, and is now adapted to the volume in its new dress. It is, however, no longer placed at the beginning of the work, but will be found immediately before the indices. It has been gratifying to the author to know that this table is habitually consulted by some of the most experienced Botanists." The author then points out the attempts he has made to improve the nomenclature, but as far as concerns the change in the English names of the Natural Orders, we must confess that the sound is intolerable to our ears. We cannot conceive that any well educated person (and none else can be expected to study the Natural Affinities of plants to advantage), will prefer the use of the Terms, *Orchids, Hippurids, Amaryllids, Irids, Typhads, Arads, Cucurbits*, as English equivalents for *Orchideæ, Hippurideæ, Amyryllideæ, Irideæ, Typhaceæ, Aroideæ, Cucurbitaceæ.* This is, however, a mere matter of opinion, and as we before observed, our object it is not to perform the part of a critic.

Such is the general outline of the plan of the "Vegetable Kingdom," a work, for the proper execution of which are required such an enlarged knowledge of the principles of Botany, such experience in the examination of Genera and Species, such extensive reading, such an access to the labour of others, such taste in the selection and arrangement and execution of the figures, and above all, such amazing industry, as fall to the lot of few men of science, but which are assuredly combined in the Author of the work now before us; and the book will be read and studied accordingly.

The subjects of the plates are peculiarly well selected, and the plates themselves skilfully executed, and never were figures of plants, and analyses of fructification turned to so good an account as on the present occasion.

Mr. Thos. Lobb's Java Plants.

Mr. Heward, Young Street, Kensington, is charged with the distribution of the sets of the exquisitely beautiful and rare specimens of the mountains of Java, collected by Mr. Thos. Lobb. The number of sets is but small, and the amount of species in each varies from 100 to 200, or nearly so. More perfect specimens have never been offered for sale, and the price is £2 the 100 species, exclusive of share of freight and commission. A list of the names of many will soon appear in this Journal.

Notes on the VEGETATION *and general character of the* MISSOURI *and* OREGON TERRITORIES, *made during a Botanical Journey in the State of Missouri, and across the South Pass of the* ROCKY MOUNTAINS, *to the Pacific, during the years* 1843 *and* 1844 ; *by* CHARLES A. GEYER.

(*Continued from p.* 41, *Vol. V.*)

Preliminary Remarks.—The great Rocky Mountain chain and the broad desert of the Blue Mountains divide the Oregon eastwardly from the comparatively civilized parts of North America. The means of communication north and southward is equally obstructed by mountains, woods and torrents.* Only from the west is this region accessible by a

* There is very little or no hope that these impediments to communication, especially towards the south-east and west, will ever be successfully overcome. Allowing the possibility that (according to the sanguine wishes or expectations of Mr. Parker and others) railroad-stations may be established over level regions, the greatest difficulties would be experienced by the fully six months long, snowy and stormy winters; and the masses of flying sands in the wide deserts, which must still be traversed, for at least three months out of the remaining six. Nor is there any possibility, according to the opinions of the Hon. Hudson's Bay Company's sea-officers,

most hazardous entrance into the Columbia or Oregon River. Good natural harbours, however, exist at Puget Sound; but the country there is so wild and rugged that it will require immense labour to open a road thither.

These are not all the respects in which Oregon is inferior in value for agricultural purposes, to any new territory on the Upper Mississippi waters. Upper Oregon again is by nature severed from the lowlands, by mountains and cataracts, very difficult to pass; and for the conveyance of all their bulky, heavy, natural and agricultural productions, to a distant and uncertain market, the future settlers must either trust to the dangerous Columbia River, or the backs of mules and horses. Lower Oregon, with the exception of the, in all respects beautiful and fertile, but narrow Wallamette valley (and a few still more limited localities), is, generally speaking, traversed by mountains and high ridges, from about 300 to 1000 feet high, bristling with impenetrable pine-forests, which render the many narrow stripes of lowland, boggy and mossy ground very difficult to travel. The latter too, I am told, are subject to inundation almost every spring; especially along the banks of the Columbia river. The only mode of communication now used by the settlers is by water.

After weighing the many and heavy disadvantages of access and stating too that the soil in general is far inferior in fertility and capability to that of the Mississippi valley, we may wonder why so many American citizens of the United States leave their desirable residences in the back parts of their own country, and undertake, with their families, and moveable property, a perilous journey of five months through the wilderness, in order to search for a new home in Oregon territory! Not less wonderful is it that the final possession of that territory causes, and has already caused, so many violent demonstrations in the councils of several nations. Certainly Oregon will make a stronghold, for it is already so strong,

that the entrance to the Columbia river ever can be improved or contracted by any sort of works nor even attempted, owing to the tremendous force of the sea at that place.

that it is equally difficult and perilous to get out, as to get in!

By explaining the former wonderful impulse for emigration, we may account perhaps for the latter. To do so, we must take another and wider view of Oregon, by adding to that territory the whole north-west coast, and even more; from Mount Elias, down to the gulf of California; or from the limits of vegetation down to the centre of the region of palms! So we have the whole western slope of the northern Andes, with the exception of part of Old Mexico, comprizing every climate, and all the elements necessary for the formation of a mighty future empire. Such a prospect does the American contemplate for Oregon, though he may be, for the present, apparently contented with that territory alone! His true aim is directed to the final possession of the entire coast! His daring mind is ever speculating and weighing the probable advantages which virgin countries may offer to his love of enterprise. Joined enthusiastically by his fellow citizens in any such project, he breaks through all obstacles, and defies, backed by great numbers, the cabinet regulations of any other, and even his own government, to attaint the given object. Wherever he has selected a home, he tries to establish his political principles, at his peril; with them, he is contented, without them, unhappy. Trusting his rights to no other hands but his own, he despises over-careful governments, and hired military power; but is ever ready for defence, if compelled by necessity, and to handle the rifle instead of the plough. Such are the main features of an American countryman, especially of the farmers in the Mississippi valley; and those individuals in foreign countries are much mistaken, who believe that American politics, affecting the material welfare of that nation, will ever be subject to a single impulse, as in Europe. Such, also, are those thousands of men who have already emigrated to Oregon and California; including as well may be supposed, many disreputable characters. Yet, few young colonies on record, have conducted themselves so orderly, by all reports, as the settlers

have in the Wallamette valley, and whether this be owing to the moral influence and good examples given by the officers of the Hon. Hudson's Bay Company, or not, it is equally praiseworthy.

Ere long, the hardy scattered emigrants both in Oregon and California will consolidate a government and appear on the theatre of nations, independent of all others. They will, by their enterprize and unceasing civil conquests, overcome successfully the heroic indolence of their Mexican neighbours, regenerate their political and social institutions, and form, in connection with the mother country, on that coast, a great western empire; an outpost of civilization, which, in time, will be the doom for the reckless despotism in the Old World, opposite the great Pacific. Of that future great empire, the present limited Oregon territory is only the nucleus.

Upper Oregon.

The plains and plateaux of Upper Oregon present themselves in the form of an amphitheatre, when viewed from north-west, only interrupted by mountain ranges. They appear terraced above each other with irregular ascents and confines, at about 1000 feet difference of altitude.

The rivers of Upper Oregon are all torrents and tributaries of the great Columbia, a river of second-rate magnitude in North America. Those tributaries rush from every point of the compass, except west, hurrying with fearful velocity towards their main channels; forming, one and all, for more than a thousand miles, dangerous rapids and whirlpools in close succession. They are, for the most part, difficult and dangerous, or unfit to navigate, even the united Columbia is only free from obstruction for about 120 miles above its mouth.

2nd Region, the Green Mountains.—South-east of the great northern Rocky mountain chain, and linked to it, lies the range of the Green Mountains, which, dilating itself to the great plateaux, slopes off towards the south-pass. It like-

wise sends off many lateral spurs towards west north-west, likewise stretching in plateaux, or contracting sometimes and forming high pine-clad mountains, whose summits are wrapped in snow, which occasionally endures through the summer; feeding by innumerable rivulets, the upper forks of the greater tributaries to the Columbia, which rush through the placid valleys or deep dark defiles. Finally, the body of these spurs dilates more and more, till they all lose themselves in a belt of plateaux, eastward parallel with the great curve of the main Columbia, leaning southwardly against the Blue mountains, sloping off westward, and ceasing at about 1000 feet elevation above the lower Columbia level. They are diversified by sundry minor mountains and ridges, besides the Blue mountains, and they enclose within steep cliffs of 1000 or 2000 feet high, the now collected streams which, rock-bedded and rock-bound, dash and foam along their precipitate course.

Highly picturesque scenery, a healthy climate of the first order, a serene sky which heightens the beauty of its clear waters, render this country of evergreens peculiarly pleasant. Though the waters are snowy and bright, the cold is remarkably moderate. The rivers are scarcely ever frozen, which may be owing in a degree to their swift currents. The summers are warm and sunny, and a beaming morning in the month of June and July displays endless charms for the admirer of natural beauty. The luxuriant green of the mountains in the background, the lakes, the rivers with their falls, the gigantic pine-forests, separated by meadows into parklike groups, with the highly coloured flower-carpet, figured beautifully by dense masses which appear conglomerated together of each sort, far more exclusively than on the eastern side of the Rocky mountains, form a charming coup-d'œil. Water scenery especially is a feature of extreme beauty in Upper Oregon, no turbid waters are to be seen, and clear as the stream gushes out of the rocky source, it goes the same into the ocean. The rivers abound in salmon and trout. It is very amusing to watch the course of these fish up the torrents on a

July morning, when great numbers are seen constantly in the air, trying with all their strength to leap over the cataract; at last the creature resorts to a more quiet place, and repeats his summersault; but falls unfortunately into the lurking basket of the Indian, who lies on the sunny rock above, watching his victim.

Apparent geological features.—The pseudo-columnar basaltic ranges which wall the bases of the mountains, mentioned already in the former regions, are common in these districts, particularly along the sides of the plateaux. Their contrasting appearance imparts a certain freshness to the vegetation. A great part of the côteau of the plateau, at the united Lewis, Saptona, or Snake river, contains precipices of regular columnar basalt.

The sterile plateaux are of a trappean formation, covered either with loam or sand, containing series of rounded conic piles of inconsiderable height, and in the centre lofty walls, like perpendicular truncated masses of 1-2000 feet high. This rock appears as if cast over that whole region, known as the Spokan plains of the Upper Columbia.

The naked sides of mountains or summits are mostly of gray granite, which has a slight south-easterly, but often only a local inclination, often finely grained and laminated on the same block. Granite mountains also, in this region, maintain a vegetation when they are not denuded by fires.

Of minerals, lead occurs in conglomerate with pyrites, on the côtes of Coutennay river; it was discovered by Chief-factor Macdonald, and the spot is only known to him. Very few localities in Upper Oregon present secondary rocks to any extent.

General character of the vegetation.—Eastern portion of the great western region of the *Coniferæ*! Apparent centre of the *Umbelliferæ*, *Scrophularinæ*, *Asphodeli*, and *Rhinantheræ* in N. America! The families which abound in several genera are: *Polemoniaceæ*, *Boragineæ*,* *Vaccineæ*, *Ranuncu-*

* *Leguminosæ*, to which add, also *Caprifolia* and *Rhamni!*

laceæ, Cruciferæ, Portulaceæ, Onagrarieæ, Rosaceæ, Polygoneæ, Lysimachieæ, Smilaceæ, Liliaceæ, Violæ, Caryophylleæ, Amygdaleæ;—of *Compositeæ*, the *Inuleæ, Astereæ, Anthemideæ, Cichoraceæ*;—also *Irides, Cyperoideæ*;—of *Gramineæ*, prevail *Festucaceæ*, and *Avenaceæ*, rarely *Agrostideæ*. Families with one representative only, are: *Aroideæ, Arum!—Typhæ, Sparganium!—Hordeaceæ, Elymus!—Paniceæ, Beckmannia!—Aristolachiæ, Asarum! Myrti, Philadelphus!—Lineæ, Linum!—Berberides, Mahonia*, very abundant!—*Lewisieæ, Lewisia*, very abundant!—*Malvaceæ, Sida!—Geraniaceæ, Geranium*, very abundant!—*Lobeliaceæ, Clintonia!—Loranthеæ, Arceuthobium!—Acenæ, Acer!—Hypericineæ, Hypericum!—Marsileaceæ, Marsilea!—Plantagineæ, Plantago!—Cinerocephalæ, Cncus!—Grossulariæ, Ribes*, very abundant! —*Ambrosiaceæ, Ambrosia!—Thymeleæ, Comandra!—Sanguisorbeæ, Poterium!—Semperviveæ, Sedum!*—No more *Eleagneæ*, and *Atriplices!*—No *Solaneæ, Commelineæ, Urticeæ*, and *Fumariaceæ*, nor any grasses of the remaining families of the *Gramineæ!*

The bulk of the woods over the whole of Upper Oregon, consists of the majestic and valuable *Pinus ponderosa*, attaining an average height of 150 feet, and not seldom a trunk from 4 to 8 feet diameter, beautifully rounded and clothed with reddish-brown bark; the wood is very durable and heavy on account of the great quantity of resin diffused through it; hence it is called "*arbre de gomme*," by the Canadian voyageurs. The leaves are long and thick, clustering together at the ends of the branchlets; the cones also appear often in bunches of 3-5, they are ovate, with a short recurved spine on the scales. The Indians eat the seeds of this pine, but they are insipid, even when roasted. Another *Pinus* of inferior stature, growing in small groves, comprises the whole of that genus over that immense region. This species is called "*Pinette noire*," by the Canadians, it never attains a greater height than 40 to 50 feet, and very rarely so much; it has a grayish-black and coarse bark, thin branchlets; the leaves are in pairs, short and twisted; the cones small, and very seldom seen. This is

the pine of which the Indians eat the young cambium, which they scrape off with a knife, after removing the bark. It is a very cooling and by no means unpleasant article of food. The two former are the trees of the level plateaux, on stony rocky, sandy soil. Different *Coniferæ* appear on slopes towards rivulets, or grassy plains, and especially in deep defiles.

Far more sombre and dense trees than P. *ponderosa* fill with perfect darkness the deep defiles in the Green Mountains, and principally the majestic *Thuja gigantea* of Nuttall. Its average height is 200 feet, and the diameter of the trunk 10-12 feet; one very large specimen, which I measured with my horse-line, came up to about 47 feet circumference. These trees are as straight as can be imagined, forming a slender pyramid with their many horizontal and slightly refracted branches, fringed with dense branchlets and elegant broad fan-like foliage. They are only found in such perfection on the vast beds of that blackish fertile soil, accumulating by the decomposition of basaltic rock. The trunks are mostly hollow, their wood splits very easily, and is lighter, though not less durable when exposed to weather, than cedar-wood. The bark is used by the Indians, especially the Cœur d'Aleines, or Skitsoes tribe, for various purposes, as for roofing their huts, they make a frail sort of canoe with it to navigate their placid river and lakes, and bags for carrying their roots and use it for binding their fishing apparatus. The tree is indeed very useful to them.* Clumps of evergreen

* On our way from the Flathead to the Spokan or Cœur d'Aleine river, in November 1843, we had to traverse a high spur of the Green Mountains, already clothed with deep snow. Owing to the difficulties of this crossing, which cost us most of our horses, (having for nearly five days nothing to feed on) I could not pay proper attention to the vegetation. But this much I do know, that I saw *Taxodium sempervirens* growing with the *Thuja gigantea*, on the borders of these woods, and that my hungry animal fed upon its branches; they were all low slender trees, of a somewhat naked aspect; but I never met with them again in any of my future excursions to similar regions.

Carices and a dense carpet of *Coptis occidentalis,* Nutt. cover most part of the black spongy soil, which is but seldom visited by frost and never by a ray of sunshine.

Abies balsamea and *Canadensis* both attain considerable size; the former is found generally near rivers; the latter is rare in these latitudes, and I have seen only a few indifferent groves of the same. A few scattered trees of *Abies Douglasii* grow scattered in Upper Oregon; not in the green mountains, but here and there on the banks of Columbia river. A species of *Larix* occurs on most of the grassy slopes, intermingled with *Abies rubra* and *alba.* To these are associated the *Salicinæ,* as *Populus candicans* and *betulæfolia, Acer glabrum, Cratæegus lucida,* and *Alnus* (215); the former *Acer,* and the last, being shrubs.

Lower parts of these mountains, especially towards Columbia river, are often closely beset with *Abies rubra,* and such tracts are impassable, until the fires have once swept through them which destroy annually an immense quantity of timber.*

Two low shrubs especially characterize this vegetation, namely, the *Mahonia aquifolia,* on sunny rocks and slopes of mountains; and the *Arctostaphylos Uva ursi,* which may be found in abundance almost every where. *Linnæa borealis* is also very common, with *Chimaphila corymbosa,* and *Pyrola secunda.*

Before we enter on the descriptions of the subregions, we must mention the fact, that Oregon has as many different floras as summer months. No spot is too arid to lodge a pretty plant, no rock too burning! It is not uncommon in a period of three weeks to see a plain covered with snow, decked with

* It is a curious fact, that while the forests are left undisturbed, the remains are always composed of such or such kinds in almost unchanged proportion. Not so when fire has swept over, and has destroyed the pristine race of trees; then others spring up, which before were either not at all there, or in the minority. So where *Pinus ponderosa* is removed by fire, *Abies rubra* will fill that space to suffocation; if after a few years it is burnt again, another tree takes the place.

flowers, and so burnt up again, that you can find nothing to testify of the gaudy blossoms, which have been dried by the sun, and swept away by the wind!

I. Subregion. Grassy Mountains and Plateaux of Skitsoe, or Cœur d'Aleine river, in April and May.

Scarcely has the sun effaced from the snow the prints of the horses' hoofs in the plains, when the first flower in that region, *Ranunculus glaberrimus*, Hooker (459), shows its large yellow glistening orb out of the snowy embankments. Just so does *Viola* (608) appear in the river valleys; the latter indeed never ceases, but produces apetalous flowers under the snow during the winter, which at the first opportunity, display themselves. The deep snow soon melts, and all at once the whole country is ornamented by flowers, which exhibit a brighter degree of colouring than could be expected from the first rays of the spring sun.

Commencing on a cold plateau, near Skitsoe or Cœur d'Aleine river, we may see at once all the plants together, which bring their flowers forth at the beginning of spring. It is a trap plateau, naked and overlayed with a thick layer of loam. Here appears first the above *Ranunculus* in abundance, scattered among masses of *Sedum stenopetalum*, which infest the whole locality, together with its parasite, *Orobanche* (372), which is very abundant and in full bloom. One quarter is occupied by the pretty *Primulacea* (No. 319), its root is a vertical ramose brittle tuber, its leaves and flowers are prostrate, the corolla is chalky white with elegant purple reticulation, and it has golden-yellow bearded nectaries at the base of the segments. Next space comes occupied by *Ferula* (325), and close to it *Ferula* (298); both grow separately and so densely, that their white and golden umbels touch each other. The former is a rare species and occurs only there, it has farinaceous tubers, which are gathered by the Indians, like those of many other species of this genus. The other yellow species is a curious plant, it being only a biennial, but it forms a tuber to live over that one winter. Another portion of this plateau is clothed with the

pretty *Platycarpum scapigerum*, and then follow carpets of *Claytonia* (386, 317, 387), of *Fritillaria* (315) with a small drooping yellow flower, sometimes it has a fulvous belt across the petals; also dense masses of *Collinsia* (462), and of *Phlox?* (371), both diminutive, but pretty plants. On the southern slope of this place come, at last, *Phacelia* (463), *Ferula* (301), *Arabis aurea*, with *Saxifraga* (619 and 625), both very common throughout the Oregon.

Just the same flora appears about two weeks earlier on the rocky islands of the Columbia, near Fort Colville; but in no other locality did I find these plants all together, nor in such quantities.

We will now survey the sunny basaltic rocks, walling these fertile highlands, along the valley of Skitsoe river.

The plant which always accompanies the basalt or trap formation, from the Upper Platte through Oregon, is the *Mahonia aquifolia.* It forms low shrubs, not so slender as in Europe, but with larger and thicker leaves, and every part is more robust. I have found gentle mountain slopes, down to a fork of Muddy River, where the *Mahonia* had taken sole possession for a mile or so, appearing as if sown there; only a few specimens of *Prunus* were scattered through these masses. In Upper Oregon it is invariably seen growing on sunny banks with the large species of *Peucedanum* (328), it shows a great profusion of flowers about the middle of April, in the stamens of which I observed the same irritability as in the common *Barberry*, but only at noon. The berries have an agreeable acid taste, more so than those of the European species, and the Indians collect them, but seem not very fond of them.

(*To be continued.*)

Contributions towards a FLORA OF BRAZIL, *being the distinctive Characters of some new Species of* COMPOSITÆ, *belonging to the tribe* VERNONIACEÆ, *by* GEORGE GARDNER, ESQ., F.L.S. *Superintendent of the Royal Botanic Gardens, Ceylon.*

(*Continued from p.* 136 *of Vol. IV.*)

VERNONIA, *Schreb.*

Sect. HOLOLEPIS, DC.

4751. V. *imbricata*; fruticosa, ramis confertis teretibus tomentosis, ramulis ad capitula usque foliosis, foliis sessilibus 1-nervibus coriaceis confertis oblongo-linearibus integerrimis supra glabris subtus tomentosis, capitulis cylindraceis 10-floris, involucri squamis lineari-lanceolatis acuminatis uninervibus, achænio multicostato scabrido, pappo pluriseriali, paleis inæqualibus barbulatis.

HAB. Bushy places on the Serro do Frio, near Milho Verde, province of Minas Geraes. Aug. 1840.

Frutex bipedalis. Folia 3 lin. longa, lineam lata. Involucrum cylindraceum, subtriseriale, squamis extus tomentosis, ciliatis, 3 lin. circiter longis. Corolla violacea, lobis extus pilosis. Pappus flavescens.

This elegant heath-like shrub is nearly allied to V. *ericoides*, (Gardn. Less. n. 4750); but is readily distinguished by its much shorter broader leaves, its shorter, less deeply sulcated, and scabrous achænia, and its pappus of several unequal series. My n. 4752, is the V. *Pseudo-myrtus* of St. Hilaire, also belonging to this section.

4754. V. *Burchelliana*; fruticosa, ramosa, ramis teretibus velutino-tomentosis, ramulis angulatis, foliis petiolatis oblongo-lanceolatis basi angustatis apice obtusis integerrimis coriaceis uninervibus subeveniis utrinque velutino-tomentosis, capitulis ad apice ramorum 3-4 sessilibus con-

gestis 15-floris, involucri squamis imbricatis lineari-lanceolatis acuminatis trinervibus subtomentosis ciliatis, achænio multicostato, pappo biseriali, paleis æqualibus ciliatis.

Hab. Serro do Frio, province of Minas Geraes. August, 1840.

Frutex 4-pedalis. Folia supra viridia subtus rufescentia, 18-20 lin. longa, 4-6 lin. lata, obscure venosa. Petioli 2-3 lin. longi, supra canaliculati. Involucrum imbricatum, 4 lin. longum. Corolla violacea, glabra. Pappus nitidus, flavescens, setis caducissimis.

Allied to V. *oleaster*, DC. (Gardn. n. 4753); but sufficiently distinguished by its much larger leaves, fewer flowers, and longer and more acuminated involucral scales.

4754. V. *Martiana*; caule fruticoso erecto ramoso, ramis teretibus cano-tomentosis, ramulis sulcato-angulatis, foliis petiolatis elliptico-oblongis vel elliptico-ovatis basi acutis apice obtusis integerrimis coriaceis obscure penniveniis utrinque dense velutino-tomentosis, capitulis ad apices ramorum 1-3 sessilibus congestis 25-floris, involucri squamis imbricatis dense albo-tomentosis linearibus obtusis, achænio glabro 10-costato, pappo biseriali, paleis æqualibus ciliatis.

Hab. Among rocks in the Diamond district. Aug. 1840.

Frutex 3-pedalis. Folia supra viridia, subtus albida, 2-3 poll. longa, 12-15 lin. lata. Corolla violacea, lobis extus ad apicem pilosis. Pappus rufescens.

Evidently related to the last species, but its leaves of a different form, its greater number of florets, obtuse involucral scales, and pilose corolla, sufficiently establish it as a distinct species.

Sect. Leptospermoides, DC.

4798. V. *foliosa*; fruticulosa, ramosa, ramis teretibus canotomentosis ad capitula usque fere foliosis, foliis sessilibus linearibus pungentibus margine revolutis supra glabris

subtus nervo medio excepto albo-tomentosis, capitulis multifloris ad apices ramulorum solitariis, involucri squamis imbricatis extus piloso-tomentosis, externis ovato-lanceolatis pungentibus 1-nervibus, internis oblongo-lanceolatis acuminatis 3-nervibus, achænio piloso, pappo biseriali, setis exterioribus latioribus multo brevioribus.

HAB. Serra de Taguari, province of Minas Geraes, Sept. 1840.

Caulis apice ramosus, foliosus. Folia supra viridia 1-1½-pollicaria, lineam lata. Involucrum campanulatum, squamis imbricatis apice subsquarroso-pungentibus. Corolla purpurea, glabra. Achænium dense albo-pilosum. Pappus albidus.

Except in the mode and nature of the inflorescence, this plant agrees with the description of V. *rosmarinifolia*, Less. which Decandolle places in the last division of his section *Lepidaploa*. My plant certainly belongs to the section *Leptospermoides*.

Sect. VANILLOSMA, Less.

4759. V. *oblonga*; fruticosa, scandens, ramis teretibus fulvo-tomentosis, foliis petiolatis oblongis basi obtusis apice obtuse acuminatis minute glanduloso-denticulatis supra glabris subtus fulvo-tomentosis, capitulis ad axillas foliorum glomeratis sessilibus 3-floris petiolo longioribus, involucri foliolis oblongo-lanceolatis obtusis glabriusculis subciliatis, achænio oblongo subtrigono glaberrimo, pappi serie externa interiore duplo breviore.

HAB. Margins of woods near Morro Velho, province of Minas Geraes. Sept. 1840.

Frutex scandens, ramosus. Folia supra viridia, pennivenia, 3-poll. longa, pollicem lata. Petioli teretes, supra sulcati, tomentosi, 3-4 lin. longi. Pappus argenteus.

Allied to V. *axillaris*, Less. but distinguished by its fewer florets, and by the external row of the pappus being no broader than the inner.

Sect. Lepidaploa, DC.

5508.* V. *platycephala*; fruticosa, ramis teretibus striatis pubescenti-tomentosis, foliis petiolatis oblongis basi acutis apice acuminatis supra puberulis demum glabriusculis subtus pubescenti-tomentosis integerrimis penninervibus, capitulis 5-9 pedunculatis corymbosis ebracteatis multifloris, involucri squamis floribus multo brevioribus tomentosis, externis linearibus obtusis, internis lanceolatis acutis, corolla glabra, achænio parce villoso, pappi serie externa vix paleacea, acuta, brevi.

Hab. In low woods on the ascent of the Corcovado, near Rio de Janeiro. Jan. 1841.

Frutex 6-8-pedalis, ramosus. Folia supra viridia, subtus pallida, 3-4-poll. longa, 12-15 lin. lata. Petioli 6-9 lin. longi. Involucrum hemisphæricum. Pappus rufescens.

Judging from the description this species comes near V. *asteriflora*, Mart. but differs from it in having petiolate leaves, and very different involucral scales.

4803. V. *florida*; fruticosa, erecta, ramosa, glabra, ramis angulato-striatis, foliis vix petiolatis oblongis basi attenuatis apice obtusis breviter apiculatis distanter glanduloso-dentatis utrinque glabris, ramis floridis axillaribus folio paulo longioribus foliolosis 10-15-cephalis in paniculam amplam dispositis, capitulis pedicillatis 6-10-floris, involucri squamis imbricatis glabriusculis, externis ovatis obtusis ciliatis, internis lineari-oblongis obtusis, achænio oblongo resinoso-glanduloso parce piloso, pappi serie externa paleacea acuta brevissima.

Hab. Campos near Cattas Altas, province of Minas Geraes. Sept. 1840.

Frutex 3-6 pedalis. Folia supra nitida, subtus pallida,

* I received two very different species under this number, one is the V. *platycephala*, the other is the same as Martius' Herb. Fl. Bras. n. 546. —(G. B.)

15 lin. longa, 4-5 lin. lata. Corolla violacea, glabra. Pappus rufescens.

Although this is rather a common plant near the foot of the Serra da Caraça, and must have been found by Spix and Martius during their visit to that mountain, I do not find any description that will agree with it. It evidently belongs to the first section of the tribe *Lepidaploa*, and seems to come near V. *vagans*, DC. a native of India.

4800 et 4801. V. *collina;* suffruticosa, erecta, ramis striatis fulvo-tomentosis, foliis brevissime petiolatis coriaceis ellipticis vel ovato-ellipticis basi rotundatis vel cordatis apice mucronatis distanter minute glanduloso-dentatis supra glabriusculis subtus fulvo-tomentosis, ramis floridis axillaribus folio multo longioribus ramulosis foliolosis in paniculam amplam elongatam dispositis, capitulis ad apices ramulorum 3-6 breviter pedicellatis 12-floris, involucri squamis imbricatis subtomentosis, externis ovatis acutis, internis lineari-oblongis obtusis, achænio 10-costato glanduloso-resinoso parce piloso, pappi serie externa paleacea brevissima.

HAB. Open hilly places near Morro Velho, province of Minas Geraes. Sept. 1840.

Suffrutex 3-pedalis. Folia supra minute scrobiculata, obscure pennivenia, 9-10 lin. longa, 6-7 lin. lata. Corolla violacea, glabra. Pappus stramineus.

Although considerably different in general aspect, the plant has considerable affinity with the preceding species. In my own specimen of n. 4801, the branches are congested at the top of the stem, evidently from some casuality which has happened to the axis. The leaves in it are also more decidedly cordate, and more woolly beneath than in n. 4800.

2894. V. *Riedeliana;* fruticosa, ramosa, ramis sulcatis rufo-tomentosis, foliis subsessilibus ovato-ellipticis basi subcordatis obtusissimis integerrimis margine vix revolutis supra glaberrimis nitidis subtus fulvo-tomentosis penniveniis reticulatis, capitulis 1-3 axillaribus sessilibus vel ad apices ramulorum 5-floris, involucri squamis 3-serialibus, externis

ovatis obtusis extus rufo-tomentosis, intimis lineari-oblongis obtusis extus ad apicem rufo-tomentosis, achænio turbinato villosissimo, pappi serie externa paleacea longi acuminata, interna complanata serrulata acuta duplo et ultra longiore.

HAB. Near Santa Rosa, District of the Rio Preto, Province of Pernambuco. September, 1839.

Frutex 3-4-pedalis. Folia 2-2½ poll. longa, 15-18 lin. lata. Involucrum oblongo-cylindraceum, valde deciduum. Corolla glabra, purpurea. Pappus duplex, persistens lucens, albidus, paleis externis angustis acuminatis, intimis triplo fere longioribus complanatis margine scabris.

I was at first inclined to refer this plant to the genus *Stilpnopappus*, from the decided paleaceous nature of both series of the pappus, but a more attentive examination has induced me to place it in the present section of *Vernonia*.*

4802. V. *laxa*; herbacea, ramosa, ramis elongatis angulato-striatis parce pubescenti-tomentosis, foliis sessilibus late linearibus acutis glanduloso-denticulatis supra glabriusculis subtus fulvo-tomentosis, ramis floridis axillaribus folio longioribus foliolosis in paniculam laxam dispositis, capitulis pedicellatis 10-floris, involucri squamis imbricatis glabriusculis oblongis obtusis, achænio 10-striato parce piloso, pappi serie externa brevi.

HAB. Near Formigas, in the Sertão of the Province of Minas Geraes. July, 1840.

Herba 3-5-pedalis. Folia 3 poll. longa, 4 lin. lata. Involucrum subcylindraceum, squamis ad apicem coloratis. Corolla glabra, violacea. Pappus argenteus.

* This plant is evidently closely allied to V. *speciosa*, Less. DC n. 244, which, according to Martius Flora, 1841 v. 2, Beibl. p. 109, (Herb. Fl. Br. n. 691), is the same as *Strophopapus bicolor*, DC., and is there referred to *Stilpnopappus*, under the name of S. *patulus*. The habit is very unlike that of *Stilpnopappus*, and the pappus very different from that of most *Vernonia*. Probably De Candolle's genus, *Strophopappus*, should be restored to include the above two plants as well as Gardner's n. 3259 and 4189, both of them new species from the Province of Goyaz.—(G. B.)

This species is undoubtedly allied to the preceding one, though very distinct in many respects.

4778. V. *cuneifolia*; herbacea, erecta, caule simplici tereti striato cano-tomentoso, foliis sessilibus coriaceis cuneatis apice obtusis serrato-dentatis supra subtomentosis demum glabratis subtus dense cinereo-tomentosis, cymæ terminalis ramis parvis dichotomis, capitulis 9-10-floris, involucri squamis glabriusculis lineari-oblongis obtusis 1-nervibus, achænio parce piloso, pappi serie externa setosa brevi.

Hab. In a marsh on the Serra das Araras, on the western confines of the Province of Minas Geraes. June, 1840.

Herba erecta, bipedalis. Folia alterna, pennivenia, reticulata, 15-lin. longa, 6-7 lin. lata. Involucrum cylindricum. Corolla glabra, pallide purpurea. Pappus argenteus.

This species belongs also to the *Lepidaploa* section, but is very distinct from any of the described species contained in it.

5509. V. *Estrellensis*; fruticosa, ramosa, ramis angulatis cinereo-pubescenti-tomentosis, foliis petiolatis longe lanceolatis utrinque acuminatis minute serratis penniveniis utrinque adpresse puberulis, cymis axillaribus terminalibusque in paniculam dispositis, capitulis secus ramos pedicellatis lateralibus 10-floris, involucri squamis pubescentibus ciliatis, externis ovatis obtusis, internis lineari-oblongis obtusis, achænio piloso, pappi serie externa paleacea acuta brevissima.

Hab. Woods on the Serra da Estrella, Province of Rio de Janeiro. Oct. 1840.

Frutex 10-15-pedalis. Folia supra viridia, subtus pallida, 6 poll. longa, pollicem lata. Petioli 6-8 lin. longi, tomentosi. Corolla purpurea, glabra. Pappus argenteus.

Allied to V. *discolor*, Less., from which it differs in having serrated leaves, and obtuse involucral scales.

4777. V. *palustris*; herbacea, ramosa, ramis teretibus striatis pubescentibus, foliis sessilibus late ovato-ellipticis basi attenuatis semiamplexicaulibus apice acuminatis argute subduplicato-serratis penniveniis supra adpresse puberulis

subtus pubescenti-tomentosis, cyma ramosissima laxa paniculæformi polycephala aphylla, capitulis pedicellatis 25-floris, involucri campanulati squamis glabris, externis ovato-oblongis obtusis, intimis lineari-oblongis acutis, achænio oblongo 10-costato parce villoso, pappi serie externa paleacea brevi.

HAB. In a moist wood near Conceição, Province of Minas Geraes. August, 1840.

Herba 6-8-pedalis. Folia membranacea, 6-12 poll. longa, 3-6 lata. Corolla purpurea, lobis extus ad apicem villosis. Pappus albus, setis scabridis.

Apparently near V. *Serrata*, Less.

4770. V. *compacta*; suffruticosa, ramosa, ramis valde striatis rufo-pubescenti-tomentosis, foliis subsessilibus lineari-lanceolatis utrinque acutis subintegerrimis margine revolutis, supra scabridis nitidis subtus fulvo-tomentosis, cyma ramosissima paniculæformi compacta polycephala, capitulis subsessilibus 10-floris, involucri squamis dorso subpilosis oblongis acutis, achænio 10-costato parce piloso, pappi serie externa vix paleacea brevi.

HAB. Moist places on the Serra das Araras, on the western confines of the Province of Minas Geraes. June, 1840.

Suffrutex 4-pedalis. Folia alterna, pennivenia, 2 poll. longa, 6-7 lin. lata. Involucrum campanulatum. Corolla glabra, purpurea. Pappus stramineus.

Allied to V. *denticulata*, DC., from which it is distinguished by its less angular stem and branches, the tomentose under surface of the leaves, which are also smaller, and the much larger size of the capitula.

4775. V. *fagifolia*; suffruticosa, ramosa, ramis teretibus striatis fusco-tomentosis, foliis confertis sessilibus ellipticis basi rotundatis apice acutis mucronatis serratis supra glabriusculis subtus fusco-tomentosis pellucido-punctatis, cymæ polycephalæ ramis subscorpioideis, ramis inferioribus ex axillas foliorum ortis, superioribus aphyllis, capitulis secus ramos sessilibus lateralibus 15-floris, involucri cam-

panulati squamis oblongis obtusis mucronatis glabriusculis, achænio oblongo 10-costato parce piloso, pappi serie externa paleacea brevissima.

HAB. Near Cidade Diamantina, the capital of the Diamond District. August, 1840.

Suffrutex 4-pedalis. Folia membranacea, supra viridia, subtus pallida, reticulata, 2-2½ poll. longa, 15 lin. lata. Corolla glabra, purpurea. Pappus stramineus.

This species is also allied to V. *denticulata*, DC., from which it is readily distinguished by its elliptical leaves, and much larger capitula.

4776. V. *neriifolia*; suffruticosa, ramosa, glabra, ramis elongatis teretibus striatis, foliis petiolatis lineari-lanceolatis utrinque acuminatis minute glanduloso-denticulatis margine revolutis utrinque glabris supra lævibus nitidis, cyma ramosissima paniculæformi polycephala, capitulis sessilibus 25-floris, involucri squamis glabriusculis, externis ovatis obtusis ciliatis, intimis oblongis obtusis, achænio 10-costato parce piloso, pappi serie externa paleacea brevissima.

HAB. On the banks of the Rio Claro, on the western confines of the province of Minas Geraes. June 1840.

Suffrutex 6-pedalis. Folia supra viridia, subtus pallida, reticulata, 6-poll. longa, 6-7 lin. lata. Corolla purpurea glabra. Pappus rufescens.

Allied to V. *psittacorum*, DC., from which it is essentially distinguished by its much longer glabrous leaves, and the very much shorter external ray of the pappus.

4772. V. *membranacea*; suffruticosa, ramis teretibus striatis glabris, foliis petiolatis oblongis utrinque acutis acute serrulatis utrinque glabris supra nitidis, cyma ramosissima paniculæformi polycephala, capitulis secus ramos sessilibus lateralibus 20-floris, involucri squamis imbricatis glabriusculis externis ovatis acutis, internis lineari-oblongis acutis, achænio oblongo 10-costato parce piloso, pappi serie externa paleacea brevissima.

HAB. Dry wooded places between the Rio Celaro and San

Romão, to the west of the Rio San Francisco. June 1840.

Suffrutex 4-pedalis. Folia membranacea, supra viridia, subtus pallida, reticulata, 4-4½ poll. longa, 15-18 lin. lata. Corolla purpurea, lobis extus ad apicem pilosiusculis. Pappus rufescens.

Also allied to V. *psittacorum*, DC., differing in its much broader glabrous leaves, and more diffuse panicle.

788. V. *Corcovadensis*; suffruticosa, ramosa, ramis striatis ad apicem angulatis pubescenti-tomentosis, foliis petiolatis lanceolatis utrinque acutis minute serrato-denticulatis membranaceis supra scabridis nitidis subtus cinereo-tomentosis, cymæ polycephalæ ramis scorpioideis, ramis inferioribus ex axillis foliorum ortis, superioribus nudis, capitulis sessilibus 25-floris, involucri squamis lineari-oblongis acutis mucronatis dorso subpilosis longe ciliatis, achænio oblongo resinoso-glanduloso parce piloso, pappi serie externa setosa brevi.

HAB. In woods on the Corcovado, near Rio de Janeiro. July 1837.

Suffrutex 4-6-pedalis. Folia 4-poll. longa, pollicem lata, pennivenia, reticulata. Petiola 3 lin. longi. Corolla glabra, purpurea. Pappus stramineus.

This species very much resembles V. *polycephala*, DC., in habit, but in De Candolle's very artificial division of the section *Lepidaploa*, it ought to stand near V. *psittacorum* and V. *hebeclada*, from its having acute, not acuminated, involucral scales.

1716. V. *crenata*; caule suffruticoso ramoso, ramis angulatis pubescentibus, foliis breviter petiolatis oblongis utrinque obtusissimis crenatis supra scabris subtus fulvo-tomentosis, cymæ ramis plurimis ramosis in paniculam dispositis, capitulis secus ramos sessilibus lateralibus 30-floris, involucri subcampanulati squamis ovato-lanceolatis acutis glabriusculis, externis subciliatis, achænio oblongo parce piloso, pappi serie externa paleacea acuta brevissima.

Hab. Common near San Romão, on the banks of the San Francisco. July 1840.

Suffrutex 8-10-pedalis. Folia submembranacea, penninervia, reticulata, 3-4 poll. longa, 15-20 lin. lata. Petioli 1½ lin. longi. Corolla glabra, pallide purpurea. Pappus stramineus.

Closely allied to V. *polycephala*, DC., differing chiefly in its angular branches, its more decidedly crenate leaves, less diffuse panicle, and greater number of florets.

4764. V. *lanuginosa*; caule suffruticoso scandente ramoso, ramis teretibus striatis cinereo-lanuginoso-tomentosis, foliis petiolatis late ovatis basi abrupte acuminatis apice acutis vel subacuminatis argute serrato-dentatis supra pubescentibus subtus cinereo-tomentosis, cymæ ramis scorpioideis, capitulis secus ramos sessilibus lateralibus ebracteatis 30-35-floris, involucri campanulati squamis dorso tomentosis lineari-lanceolatis valde acuminatis 3-nervibus, corollæ lobis pilosis, achænio oblongo 10-costato parce piloso, receptaculo epaleaceo, pappi serie externa paleacea achænii vix longitudine.

Hab. Bushy places near Formigas, in the Sertão of the Province of Minas Geraes. July, 1840.

Suffrutex subscandens. Folia alterna, membranacea, pennivenia, reticulata, 3-3½ poll. longa, 1½ poll. lata. Petioli 6-lin. circiter longi. Corolla purpurea. Pappus argenteus.

Allied to V. *scorpioides*, Pers., from which it differs in its more acuminated and 3-nerved involucral scales, its glabrous receptacle, and its shorter and more paleaceous external pappus.

4795. V. *stricta*; suffruticosa, ramosa, ramis teretibus striatis subtomentosis demum glabratis, foliis sessilibus lineari-oblongis obtusis mucronatis integerrimis margine revolutis supra minute scabris adpresse pilosis subtus dense piloso-tomentosis, paniculæ terminalis ramis lateralibus simplicibus aut rariter bifidis parvis aphyllis oligocephalis, capitulis sessilibus 18-20-floris, involucri campanulati squamis

glabriusculis longe acuminatis pungentibus, receptaculo nudo, achænio dense sericeo-villoso, pappi serie externa paleacea brevi.

HAB. Near Formigas, in the Sertao of the province of Minas Geraes. June, 1840.

Suffrutex 1-2-pedalis, ramis elongatis. Panicula stricta, ramis brevibus tomentosis. Folia 6-9-lin. longa, 2 circiter lata. Corolla violacea, glabra. Pappus rufescens.

Allied to V. *holosericea*, Mart., and V. *Schwenkiæfolia*, Mart.

4791. V. *clavata*; caulibus e collo lignoso pluribus erectis simplicibus striatis dense cano-lanuginosis, foliis petiolatis lineari-oblongis coriaceis utrinque obtusis subintegerrimis penniveniis supra glabriusculis nitidis subtus dense fulvo-tomentosis, paniculæ ramis axillaribus folio paullo brevioribus subscorpioideis oligocephalis, capitulis subsessilibus 20-floris, superioribus folio stipatis, involucri squamis dorso tomentosis oblongis obtusis, achænio dense villoso, pappi serie interna ad apicem clavata, externa paleacea acuta brevi.

HAB. Elevated Campos in the Diamond District. August, 1840.

Herba 1-2-pedalis. Folia 3½-4 poll. longa, 6-lin. lata. Involucrum globoso-campanulatum. Corolla purpurea, lobis ad apicem subpilosis. Pappus sordide albescens.

It is difficult to say to which of De Candolle's divisions of *Lepidaploa* this species should be referred. The mode of inflorescence somewhat resembles that of V. *senescens*, Mart., but it is probably more nearly related to V. *coriacea*, Less.

4797. V. *arcuata*; caulibus e collo lignoso pluribus suffruticulosis teretibus striatis cano-tomentosis ad apicem ramosis, ramis floriferis simplicibus, foliis longe linearibus acuminatis pungentibus arcuatis margine revolutis uninervibus supra glaberrimis subtus lanuginoso-tomentosis, capitulis secus ramos sessilibus solitariis folio brevioribus 25-floris, supremis extra-axillaribus, involucri ovati squamis

dorso tomentosis lineari-lanceolatis acuminatis, achænio adpresse sericeo-piloso, pappi serie externa paleacea acuta interiore duplo et ultra breviore.

HAB. Serra das Araras, on the western confines of the Province of Minas Geraes. June, 1840.

Suffrutex 1-2-pedalis. Folia alterna, 3-4 poll. longa, lineam lata. Corolla pallide purpurea, glabra. Pappus stramineus.

Judging from the description, this species approaches V. *extraxillaris*, DC., but differs in its branched stem, much longer leaves, constantly solitary capitula, and fewer florets.

2199. V. *Sarmentiana*; fruticosa, tota tomento brevi cinerascenti-velutina, ramis teretibus striatis, foliis petiolatis ovatis basi obtusissimis vel subcordatis apice obtusis subintegerrimis penniveniis, venis subtus prominulis, capitulis secus ramos sessilibus axillaribus folio multo brevioribus 45-floris, involucri campanulati squamis dorso tomentosis lineari-lanceolatis acuminatis pungentibus apice reflexis, achænio sericeo-villoso, pappi serie externa paleacea brevi.

HAB. On arid hills, near the city of Oeiras, Province of Piauhy. April, 1839.

Frutex 2-3-pedalis. Folia 3-5 poll. longa, 2-2¼ lata. Corolla violacea, lobis glandulosis. Pappus stramineus.

Allied to V. *arenaria*, Mart. (Gardn. n. 2200), from which is distinguished by being more velvety, and having much larger and ovate leaves, which are very obtuse at the base. I dedicate it to Dr. Casimero Joze de Moraës Sarmento, a native of Oeiras, and one of the very few well educated inhabitants of the province, who took me to the locality where it grows. I am besides deeply indebted to him for the attentions of himself and family during a residence of several months in the city of Oeiras, while the country round was in a state of revolution.

2893.* V. *nitens*; fruticosa, tota velutino-tomentosa, ramis

* No. 4186 from the Province of Goyaz is, in my set, the same species.—G. B.

teretibus striatis, foliis subsessilibus ellipticis utrinque obtusis subintegerrimis nitidis penniveniis, venis subtus prominulis, capitulis secus ramos sessilibus remotis axillaribus folio multo brevioribus 40-floris, involucri hemisphærici squamis imbricatis dorso subtomentosis, externis ovatis obtusis ciliatis, intimis linearibus obtusis, achænio sericeo-villoso, pappi serie externa paleacea brevi.

HAB. Serra da Batalha, in the district of the Rio Preto, province of Pernambuco. Sept. 1839.

Frutex bipedalis. Folia 12-15 lin. longa, 7-8 lata, subcoriacea, velutino-nitida. Corolla violacea, lobis extus ad apicem glandulosis. Pappus stramineus.

Also allied to V. *arenaria*, though the obtuse involucral scales would place it in the previous division of the section *Lepidaploa*.

4761. V. *adamantium*; fruticosa ramosa, ramis teretibus striatis fusco-tomentosis, foliis petiolatis ovato-ellipticis basi subcordatis apice obtusis integerrimis supra adpresse piloso-pubescentibus subtus fulvo-tomentosis penniveniis, venis subtus prominulis, ramis floridis subscorpioideis, capitulis ad axillas foliorum sessilibus solitariis geminisve folio paullo brevioribus 20-floris, involucri squamis dorso pubescentibus lineari-lanceolatis subacuminatis, achænio elliptico-oblongo obtuse 10-costato, inter costis adpresse pilosis, pappi serie externa paleacea brevi.

HAB. Rocky bushy places, Diamond District. July 1840.

Frutex 4-pedalis. Folia 2-2½ poll. longa, 12-15 lin. lata. Petioli 2 lin. longi. Corolla ignota. Pappus stramineus. Allied to V. *arenaria*, Mart. and to my V. *Sarmentiana*.

1714. V. *araripensis*; fruticosa; ramosa, ramis teretibus striatis apice tomentosis, foliis subsessilibus lineari-lanceolatis utrinque subacutis subintegerrimis supra pubescenti-scabridis subtus cinereo-tomentosis, ramis floridis scorpioideis, capitulis ad axillas foliorum solitariis vel geminis sessilibus folio multo brevioribus 20-floris, involucri squamis dorso villosis acuminatissimis, corolla extus pilosa, achænio parce piloso, pappi serie externa paleacea brevissima.

HAB. Serra de Araripe, Province of Ceara. Oct. 1838.

Frutex bipedalis. Folia pennivenia, 18 lin. longa, 3-4 lin. lata. Involucrum laxe imbricatum. Corolla violacea. Pappus argenteus.

Nearly allied to V. *debilis*, Mart. (Gardn. n. 872), but from which it is readily distinguished by its narrower and much acuminated involucral scales.

4793. V. *tricephala*; fruticosa, erecta, ramosa, ramis teretibus striatis cano-tomentosis, foliis petiolatis anguste lanceolatis basi acutis apice acuminatis supra villoso-subtomentosis demum glabratis subtus lanuginoso-tomentosis, ramis floridis scorpioideis, capitulis ad axillas foliorum 1-3 sessilibus folio multo brevioribus 25-floris, involucri squamis dorso tomentosis lineari-oblongis acuminatis, corolla extus hirtella, achænio piloso, pappi serie externa paleacea brevi.

HAB. Near Conceição, Province of Minas Geraes. Aug. 1840.

Frutex 4-pedalis. Folia pennivenia, plerumque deflexa, 2½-3 poll. longa, 6-8 lin. lata. Involucrum laxe imbricatum. Corolla purpurea. Pappus albidus.

Also allied to V. *debilis*, but very distinct.

4779. V. *reflexa*; fruticosa, erecta, ramosa, ramis elongatis teretibus striatis villoso-tomentosis, foliis subsessilibus oblongo-lanceolatis utrinque obtusis apice apiculatis subintegerrimis utrinque cinereo-villoso-subtomentosis supra demum glabratis, ramis floriferis elongatis subscorpioideis, capitulis axillaribus sessilibus solitariis geminisve 20-25-floris, involucri squamis dorso villoso-tomentosis lineari-lanceolatis longe acuminatis pungentibus, externis ciliatis apice reflexis, intimis coloratis serrulatis, achænio sericeo-villoso, pappi serie externa paleacea lanceolata acuta brevi.

HAB. Arid Campos near Formigas, Province of Minas Geraes. July, 1840.

Frutex 2-3-pedalis. Folia 12-15 lin. longa, 3-4 lin. lata, pennivenia, subdenticulata. Corolla glabra, violacea. Pappus sordide albescens.

This species will range along with V. *chalybaea*, Mart., my numbers 1715, 1720, 2201, and 2641.

4796. V. *chromolepis*; suffruticosa, erecta, ramosa, ramis teretibus striatis apice subvilloso-tomentosis, foliis longe linearibus obtusis integerrimis margine revolutis supra glabriusculis subtus cinereo-tomentosis, ramis floriferis scorpioideis, capitulis extra-axillaribus solitariis subsessilibus 30-floris, involucri campanulati squamis coloratis dorso tomentosis, externis ovato-ellipticis mucronatis, intimis lineari-lanceolatis subacuminatis mucronatis, achænio glabrato, pappi serie externa paleacea brevissima.

HAB. On the banks of the Rio Urucuya, near San Romão. Province of Minas Geraes. June 1840.

Suffrutex 2-4-pedalis. Folia 4-4½ poll. longa, 3-lin. lata. Corolla glabra, violacea. Pappus albescens.

Near V. *eremophila*, Mart. but is well distinguished by its extra-axillary capitula.

1718 et 4765. V. *eriolepis*; caule suffruticoso vix ramoso erecto tereti striato fulvo-villoso-tomentoso, foliis breviter petiolatis oblongo-lanceolatis basi attenuatis apice longe acuminatis argute serrulato-dentatis supra rugosis adpresse pilosis subtus villoso-tomentosis, cymis axillaribus et terminalibus ramosis, ramis folio longioribus oligocephalis, capitulis folio florali brevioribus sessilibus 20-floris, involucri squamis laxe imbricatis dorso villoso-tomentosis lineari-lanceolatis longe acuminatis, acumine villosissimo, achænio oblongo 10-costato sericeo-villoso, pappi serie externa paleacea brevi.

HAB. Serra de Araripe, Province of Ceara. October 1838. (n. 1718). Near Papinhacauga, Province of Minas Geraes. August 1840. (n. 4765).

Suffrutex 4-5-pedalis. Folia membranacea, rugosa, pennivenia, 5-8 poll. longa, 1½-2¼ poll. lata. Corolla alba, lobis extus ad apicem pilosiusculis. Pappus sordide albescens.

Apparently near V. *longifolia*, Pers.

4767. V. *albiflora*; caule herbaceo erecto simplici tereti striato villoso-tomentoso apice paniculato, foliis sessilibus

lineari-lanceolatis basi subcordatis, apice attenuatis acuminatis apiculatis subintegerrimis supra adpresse pilosis subtus sericeo-tomentosis, ramis scorpioideis sæpe bifidis, capitulis in dichotomiis ramorum et ad axillas foliorum ramealium sessilibus solitariis geminisve folio floralibus brevioribus vel subæqualibus, involucri turbinati squamis lineari-lanceolatis longe acuminatis valde villosis, achænio sericeo-villoso, pappi serie externa paleacea brevi.

HAB. Between Formigas and the Diamond District. July 1840.

Herba 4-5-pedalis. Folia 4-5 poll. longa, pollicem lata. Corolla alba, lobis extus ad apicem pilosis. Pappus argenteus. Allied to the preceding species, and to V. *Miersiana.* (Gardn. n. 1717 and 2892.) My n. 4769, from the Diamond District, is a less tomentose variety of the present species.

6044.* V. *acutangula*; caule herbaceo erecto simplici acute angulato glabro apice paniculato, foliis petiolatis oblongo-lanceolatis utrinque attenuatis subintegerrimis glabriusculis subtus minute nigro-punctatis, ramis floriferis ramosis, ramulis scorpioideis, capitulis in dichotomiis ramorum et ad axillas foliorum ramealium solitariis subsessilibus folio brevioribus 12-floris, involucri squamis laxe imbricatis glabriusculis lineari-lanceolatis acuminatis, achænio oblongo 10-costato parce piloso, pappi serie externa paleacea brevissima.

HAB. Marshy bushy places near the city of Maranham. June 1841.

Herba 3-4-pedalis. Folia 3-3½ poll. longa, pollicem lata, membranacea, pennivenia. Corolla glabra, violacea. Pappus argenteus.

This species will range along with the preceding one with which it agrees very much in habit.

4786. V. *floccosa*; fruticosa, ramosa, ramis angulatis cano-tomentosis, foliis petiolatis coriaceis ovatis basi rotundatis vix subcordatis apice obtusis integerrimis supra floccoso-

* In my set 6047. (G. B.)

tomentosis demum glabratis subtus dense fulvo-tomentosis penninervibus, cymæ ramis plurimis dichotomis lanuginoso-tomentosis scorpioideis in paniculam dispositis, capitulis subsessilibus solitariis plerumque extra-axillaribus folio longioribus 20-floris, involucri campanulati squamis lineari-lanceolatis acuminatis, externis ad apicem valde lanuginosis, cæteris glabris, intimis glaberrimis, achænio oblongo adpresse sericeo-villoso, pappi serie externa anguste paleacea brevissima.

Hab. Upland Campos on the Serra das Araras, on the western confines of the Province of Minas Geraes. June 1840.

Frutex 4-6-pedalis. Folia 3½-4 poll. longa, 2 circiter lata. Petioli 6-9 lin. longi. Corolla glabra, alba. Pappus rufescens.

This fine plant evidently belongs to Decandolle's fourth division of the Section *Lepidaploa*, though I know no species to which it can claim near affinity.

4794. V. *subcordata*; caule herbaceo sulcato-angulato villoso-tomentoso simplici, foliis sessilibus ovatis basi subcordatis acutis mucronatis supra pilosis scabris subtus adpresse sericeo-piloso-tomentosis, ramis floridis axillaribus elongatis foliolosis ad apicem cymosis, cymæ ramis scorpioideis brevibus recurvatis oligocephalis, capitulis congestis ad axillas foliorum solitariis sessilibus 9-10-floris folio longioribus, involucri subcylindracei squamis dorso fulvo-tomentosis lanceolatis acuminatis apice coloratis, achænio adpresse piloso, pappi serie externa anguste paleacea brevi.

Hab. Near Formigas, Province of Minas Geraes. July 1840.

Herba 3-pedalis. Folia pollicem longa, 6 lin. lata. Corolla pallide purpurea, lobis ad apicem extus glandulosis piligeris. Pappus sordide albescens.

Judging from the description, this species appears to be somewhat related to V. *helophila*, Mart.

4789(2). V. *reticulata*; fruticosa, caulibus subsimplicibus

teretibus lanuginoso-tomentosis ad apicem usque foliosis, foliis vix petiolatis oblongis basi obtusis apice subacutis mucronatis versus apicem subdenticulatis membranaceis penniveniis reticulatis, venis utrinque prominulis, supra subvillosis scabriusculis subtus hirsutis, capitulis paucis campanulatis multifloris sessilibus lateralibus terminalibusque, inferioribus foliis 2 inæqualibus stipatis, involucri squamis pluriserialibus dorso piloso-tomentosis lineari-lanceolatis longe acuminatis subsquarrosis, achænio piloso, pappi serie externa paleacea brevissima.

Hab. Hills near Morro Velho, Province of Minas Geraes. September 1840.

Frutex 1½-2-pedalis, vix ramosus. Folia alterna, 2-poll. longa, 9-10 lin. lata. Involucrum 9 lin. longum. Corolla purpurea, lobis apice pilosiusculis. Pappus sordide albescens.

Apparently near V. *rosea*, Mart.

4781. V. *ararana*; fruticosa, ramosa, ramis teretibus striatis cano-tomentosis usque ad apicem foliosis, foliis sessilibus oblongo-lanceolatis utrinque attenuatis basi subcuneatis apice acutis vel subacuminatis supra villosiusculis subtus cinereo-tomentosis subintegerrimis membranaceis penniveniis reticulatis, capitulis ad axillas foliorum 1-3 sessilibus folio multo brevioribus 15-floris, involucri squamis dorso tomentosis, externis ovatis acutis, internis lineari-lanceolatis subacuminatis, achænio 10-costato glaberrimo, pappi serie externa paleacea brevissima.

Hab. Serra das Araras, on the western confines of the Province of Minas Geraes. June 1840.

Frutex 6-pedalis, ramosus, ramis elongatis. Folia 4½-5 poll. longa, 12-18 lin. lata. Involucrum ovatum. Corolla pallide purpurea, lobis ad apicem subglandulosis. Pappus sordide albescens.

Allied to V. *pycnostachya*, DC. in habit, but otherwise very distinct. One of the capitula is generally a little above the others, and hence extra-axillary.

4788. V. *ammophila*; fruticosa, parce ramosa, ramis teretibus

striatis tomentosis ad apicem usque foliosis, foliis sessilibus exacte ellipticis utrinque obtusis supra glaberrimis subtus minute pubescenti-tomentosis penniveniis reticulatis, floralibus minoribus basi subcordatis, capitulis sessilibus lateralibus et terminalibus solitariis vel rariter geminis, inferioribus axillaribus, superioribus extra-axillaribus, 50-floris, involucri subglobosi squamis pluriserialibus adpressis glabriusculis, externis late ovatis obtusis, intimis lineari-oblongis acutis 3-nervibus, achænio profunde 10-sulcato, sulcis parce pilosis, pappi serie externa paleacea brevi.

Hab. Dry sandy woods near San Romão, on the banks of the Rio San Francisco, Province of Minas Geraes. June 1840.

Frutex 4-pedalis. Folia 3-4 poll. longa 1½-2½ lata, floralia multo minora. Corolla glabra, purpurea. Pappus argenteus.

Apparently allied to V. *rosea*, Mart. My n. 4785, from nearly the same locality, is a very remarkable long narrow leaved variety. At first sight it appears a very distinct species, as I considered it to be at the distribution of my collections, but a more close examination convinces me that it is only a variety of the present species. Some of the lower leaves are nearly six inches long, and only six lines broad.

Stilpnopappus, *Mart.* DC.

2204. S. *suffruticosus*; suffruticosus, erectus, ramosus, ramis villoso-tomentosis, foliis lineari-lanceolatis utrinque acutis margine revolutis penniveniis supra villoso-scabriusculis subtus tomentosis, pedunculis secus ramos distantibus nudis folio longioribus 1-cephalis, capitulis 40-floris, involucri floribus brevioris squamis 3-seriatis, externis foliaceis linearibus subtus tomentosis, intimis lineari-oblongis acutis dorso villoso-tomentosis.

Hab. Sandy Campos near the city of Oeiras, the capital of the Province of Piauhy. May 1839.

Suffrutex erectus, ramosus, 2-pedalis. Folia 2½-3 poll. longa, 4-5 lin. lata. Corolla glabra, violacea. Achænium turbinatum, 10-costatum, sulcis adpresse pilosis. Pappus duplex, persistens, lucens, albidus, paleis externis 15 oblongis acutis serrulatis, intimis triplo longioribus setis complanatis scabris. Receptaculum fimbrilliferum.

Near S. *trichospiroides*, Mart. (Gardn. n. 2205,) from which it is distinguished by its suffruticose habit, large leaves, and more numerous florets.

2203. S. *procumbens*; caule herbaceo ramoso procumbente subradicante villoso-tomentoso, foliis lineari-oblongis utrinque, obtusis subintegerrimis penniveniis supra villoso-subtomentosis minute scabridis subtus lanuginoso-tomentosis, pedunculis secus ramos distantibus elongatis oppositifoliis 1-cephalis supra medium plerumque folium solitarium gerentibus, capitulis 35-floris, involucri floribus brevioris squamis 3-seriatis dorso tomentosis lanceolatis acuminatis, externis foliaceis.

Hab. Near Lagoa Camprida, on the eastern confines of the Province of Piauhy. Feb. 1839.

Herba 1-1½-pedalis. Folia 1½-2 poll. longa, 3-5 lin. lata. Corolla glabra, violacea. Achænium turbinatum, 10-costatum, sulcis adpresse pilosis. Pappus duplex, persistens, lucens, albidus, paleis externis 12 obovato-oblongis apice laceratis, intimis quadruplo longioribus setis complanatis scabris. Receptaculum fimbrilliferum.

Near the preceding species, and also S. *trichospiroides*, from both of which it is distinguished by its procumbent habit.

2207. S. *dentatus*; annuus, caule erecto ramoso, ramis subdichotomis teretibus striatis villoso-tomentosis, foliis sessilibus lineari-lanceolatis utrinque attenuatis apice apiculatis inferioribus irregulariter dentatis supra glabriusculis subtus albo-tomentosis, capitulis 30-floris secus ramos pedunculatis folio florali multo brevioribus, involucri squamis, 3-seriatis oblongis acuminatis villosis.

HAB. Sandy campos, near the city of Oeiras, Province of Piauhy. April 1839.

Herba annua, 1-1½ pedalis. Folia 3-4½ poll. longa, 4-7 lin. lata. Corolla glabra, violacea. Achænium turbinatum villosum. Pappus duplex, persistens, lucens, albidus, paleis externis circiter 10 oblongis obtusis serrulatis, intimis triplo longioribus setis linearibus scabris. Receptaculum fimbrilliferum.

Allied to S. *tomentosus*, Mart. (Gardn. n. 1721), but easily distinguished by its longer, broader and dentate leaves, pedunculated capitula, and fewer florets.

MONOSIS, DC.

2897. M. (*Eremosis*) *Brasiliensis*; ramis teretibus striatis minute albo-lepidoto-tomentosis, foliis petiolatis oblongis basi acutis apice obtusis integerrimis obscure penniveniis supra glabris minute nigro-punctatis subtus lepidoto-tomentosis, corymbo composito folioso, capitulis plurimis distinctis pedicellatis vel geminis sessilibus, involucri cylindracei squamis lineari-oblongis acutis.

HAB. Woods in the district of the Rio Preto, Province of Pernambuco. Sept. 1839.

Frutex 8-12-pedalis. Folia superiora 12-18 lin. longa, 4-7 lin. lata, inferiora ignota. Corolla ignota. Achænium glabrum, subcostatum. Pappus 2-serialis, setis nec longitudine nec latitudine discrepantibus pilosis scabris.

This is evidently a transition species between *Monosis* and *Albertinia*, as is shown by the frequent union at the base of two capitula.

LYCHNOPHORA, *Mart.* DC.

Sect. 1. EULYCHNOPHORA, DC.

4823. L. *Passerina*; fruticosa, ramosa, ramis subverticillatis teretibus adpresse sericeo-tomentosis demum glabriusculis,

foliis confertis sessilibus patulis subrecurvatis linearibus basi dilatatis apice pungentibus margine valde revolutis supra glabris subtus cano-tomentosis, capitulis terminalibus 1-floris in glomerulum foliis cinctum aggregatis, involucri squamis oblongo-linearibus obtusiusculis uninervibus, externis parvis tomentosis, intimis glabris.

Haplostephium Passerina, *Mart. in* DC. *Prodr.* 5. p. 78.

HAB. Bushy places, Serro do Frio, Diamond District. Aug. 1840.

Frutex ramosissimus, 3-4-pedalis. Folia 4 lin. longa, vix lineam lata. Corolla glabra, violacea. Achænium obovatum, glaberrimum, 10-costatum. Pappus duplex, paleis externis brevissimis squamæformibus obtusis albidis, intimis multo longioribus linearibus acutis margine ciliatis spiratiler tortis pallide violaceis.

This plant I take to be the *Haplostephium Passerina*, Mart. but a careful examination of it, and of two others which I possess with a similar structure and habit, discloses no character by which the genus can be separated from *Lychnophora*. In the character given in the Prodromus the pappus is said to be simple, and that is the only circumstance which distinguishes it from *Lychnophora*; but in all my three species I find an external series in the shape of small obtuse scales, distinctly obvious even to the naked eye, which must have been overlooked both by Martius and Decandolle. Such being the case, they must be placed in the first section of *Lychnophora* along with L. *rosmarinifolia*, with which they agree in habit, and in having one-flowered capitula.

4822. L. *subulata*; fruticosa, ramosa, ramis alternis vel subverticillatis teretibus adpresse sericeo-tomentosis demum glabriusculis, foliis confertis sessilibus erecto-patentibus lineari-subulatis basi dilatatis apice pungentibus margine valde revolutis supra glabris subtus cano-tomentosis, capitulis terminalibus 1-floris in glomerulum foliis cinctum aggregatis, involucri squamis lineari-oblongis acutis uninervibus extus tomentosis.

HAB. Diamond District. Aug. 1840.

Frutex ramosissimus, 3-4-pedalis. *Folia* 5 lin. longa, semilineam circiter lata. Corolla ignota. Achænium obovatum, glaberrimum, 10-costatum. Pappus duplex, paleis externis brevissimis squamulæformibus obtusis brunneis, intimis multo longioribus linearibus acutis margine integris subspiraliter tortis albidis.

Distinguished from L. *Passerina*, by its longer narrower and more pungent leaves, and the structure and colour of the pappus.

4821. L. *ramosissima*; fruticosa, ramosa, ramis subverticillatis teretibus adpresse sericeo-tomentosis demum glabriusculis, foliis confertis sessilibus patulis subrecurvatis lineari-lanceolatis basi dilatatis subacuminatis margine valde revolutis supra glabris subtus cano-tomentosis, capitulis terminalibus 1-floris in glomerulum foliis cinctis aggregatis, involucri squamis lineari-oblongis obtusissimis extus tomentosis.

Hab. Bushy places in the Diamond District. July 1840.

Frutex ramosissimus, 3-4-pedalis. Folia 3-lin. longa, lineam circiter lata, coriacea. Corolla extus resinoso-glandulosa, pallide purpurea. Achænium obovatum, glaberrimum, 10-costatum. Pappus duplex, paleis externis brevissimis squamulæformibus obtusis brunneis, intimis multo longioribus linearibus acutis margine glabris nec spiraliter tortis albidis.

This species differs from the two preceding in its shorter, broader leaves, very obtuse involucral scales, and the plane, not spirally twisted, inner paleæ of the pappus.

Sect. 2. Lychnophoroides, DC.

4824. L. *Martiana*; fruticosa, ramis teretibus crassissimo-lanuginosis, foliis patentibus lineari-lanceolatis obtusis margine subrevolutis supra basi longe lanuginosis cæterum glaberrimis scrobiculatis subtus ubique lanuginoso-tomentosis, capitulis 6-10 in glomerulum subglobosum aggre-

gatis 8-floris cylindricis, involucri squamis laxe imbricatis linearibus obtusis glaberrimis.

HAB. Elevated mountain tracts between the Diamond District and the Rio San Francisco. July 1840.

Frutex 6-8-pedalis, ramosus, ramis subverticillatis. Folia 3½-4½ poll. longa, 6-9 lin. lata. Corolla ignota. Achænium obovato-oblongum, subcompressum, 10-costatum. Pappus duplex, paleis externis 5 late squamæformibus apice obtusis laceratis, intimis multo longioribus linearibus spiraliter tortis.

This very remarkable species approaches nearest to L. *villosissima*, Mart., but is well distinguished by its more woolly branches, longer, broader and less revolute leaves, glabrous involucral scales, more numerous florets, and much fewer and differently shaped scales of the outer pappus. The inhabitants of the district where it grows, collect the wool from the branches to make beds and pillows of.

4832. L. *affinis*; fruticosa, ramis teretibus tessellato-tomentosis, foliis erecto-patentibus linearibus obtusis basi subattenuatis margine revolutis supra rugosis glabriusculis subtus tomentosis, capitulis oblongis 3-4-floris in glomerulum globosum aggregatis, involucri squamis lineari-oblongis obtusissimis glabris, pappi serie externa brevissima.

HAB. Serra de Cural del Rey, Province of Minas Geraes. Sept. 1840.

Frutex 4-5-pedalis. Folia 2 poll. circiter longa, 1-1½ lin. lata. Corolla ignota. Achænium glaberrimum, multicostatum. Pappus duplex, paleis externis squamæformibus apice laceratis, intimis quadruplo longioribus linearibus spiraliter tortis.

Near L. *Pinaster*, Mart., with which it quite agrees in general aspect, but from which it is readily distinguished by the external pappus which is four times, not a half, shorter than the internal.

4828. L. *reticulata*; fruticosa, ramis teretibus cinereo-

tomentosis, foliis sparsis sessilibus lanceolatis basi attenuatis apice obtusiusculis margine ad basim revolutis supra glabris subtus cinereo-tomentosis penniveniis utrinque valde reticulatis, capitulis 5-floris in glomerulos bracteatos congestis, glomerulis pedunculatis subcorymbosis, involucri oblongi squamis imbricatis lineari-oblongis obtusis glabris.

HAB. Near Formigas, Province of Minas Geraes. July, 1840.

Frutex ramosus, 6-pedalis. Folia 3 poll. longa, 9 lin. lata. Corolla ignota. Achænium oblongum, glaberrimum, 10-costatum. Pappus duplex, paleis externis lineari-lanceolatis subserrulatis, intimis elongatis angustis serrulatis vix spiraliter tortis albidis.

This and the following species differ somewhat in habit from the rest of the *Lychnophoræ*, resembling much more some species of *Albertinia*, but the nature of their pappus forbids their union with that genus. They evidently hold an intermediate station between the two genera, but have no characters on which to found a distinct one.

4827. L. *albertinioides*; fruticosa, ramis teretibus adpresse cinereo-tomentosis, foliis sparsis sessilibus lanceolato-linearibus basi attenuatis apice obtusis eveniis supra glabris scrobiculatis subtus ubique adpresse cinereo-tomentosis, capitulis 4-floris in glomerulos bracteatos congestis, glomerulis ad apices ramulorum subcorymbosis breviter pedunculatis, involucri squamis lineari-oblongis obtusis extus ad apicem tomentosis.

HAB. Near Villa de Itambé, Province of Minas Geraes. Aug. 1840.

Frutex 5-pedalis. Folia 3 poll. longa, 6-8 lin. lata. Corolla ignota. Achænium oblongum, glaberrimum, 10-costatum, nigro-punctulatum. Pappus duplex, paleis externis late squamæformibus obtusis erosis, intimis elongatis linearibus integris spiraliter tortis sordide albidis.

The following are the names of the previously described

species of *Lychnophora* contained in my collections: n. 4825, L. *villosissima*, Mart.; n. 4826, L. *salicifolia*, Mart.; n. 4829, L. *staavoides*, Mart.; n. 4831, L. *ericoides*, Mart.; n. 4833, L. *Pinaster*, Mart.

Albertinia, *Spreng.*

Sect. 1. Anisotrichia, DC.

2896. A. *stellata*; caule fruticoso ramoso, ramis angulatis velutino-tomentosis, foliis sessilibus lanceolato-oblongis obtusis integerrimis supra glabris, subtus adpresse velutino-tomentosis canis, pedunculis folia sua superantibus, capitulis 1-floris dense in glomerulum confertis, involucri squamis liberis tomentosis oblongo-lanceolatis acutis achænia paulo superantibus.

Hab. Grassy Campos near Santa Rosa, District of the Rio Preto, Province of Pernambuco. Sept. 1839.

Frutex 6-8-pedalis. Folia 2½-3 poll. longa, 9-15 lin. lata, pennivenia. Corolla glabra, violacea. Achænium subcylindricum, villoso-subtomentosum, 10-costulatum. Pappus 3-serialis, radiato-stellatus, stramineus, setis omnibus angustis acuminatis scabridis, seriei exterioris triplo fere brevioribus.

Near A. *rufiseta*, and A. *pallidiseta* of Decandolle, but differs from both in having angular branches, and in the shape of the leaves and involucral scales.

4812. A. *Candolleana*; subarborea, ramis angulatis velutino-tomentosis, foliis petiolatis oblongo-lanceolatis utrinque acuminatis supra nervo medio velutino-tomentosis cæterum glabriusculis subtus adpresse velutino-tomentosis canis, capitulis 3-floris in glomerulum globosum foliis paucis parvis subsessilibus sæpe cinctum dense aggregatis, glomerulis pedunculatis, pedunculis ad apicem late complanatis, involucri squamis lineari-lanceolatis acutis extus tomentosis, achænio glabro costato, pappi paleis seriebus 3, seriei exterioris duplo brevioribus.

Hab. Near Villa do Principe, now Cidade do Serro, Province of Minas Geraes. Aug. 1840.

Arbor 10-12-pedalis. Folia 3½-5 poll. longa, 12-14 lin. lata, membranacea, pennivenia. Corolla ignota. Achænium basi subglanduloso-resinosum. Pappus pallide purpurascens.

Near A. *bicolor*, DC., but abundantly distinct.

Sect. 2. Isotrichia, DC.

1713. A. *arborea*; subarborea, ramis angulato-striatis adpresse velutino-tomentosis, foliis petiolatis elliptico-oblongis basi attenuatis apice acutis vel subacuminatis integerrimis supra glabriusculis adpresse velutino-tomentosis canis, capitulis 3-floris dense in glomerulum pedunculatum congestis, involucri squamis lineari-oblongis obtusis tomentosis, intimis longioribus, achænio multicostato glabro, pappi paleis seriebus 2 æqualibus.

Hab. Woods on the Serra de Araripe, Province of Ceara. Oct. 1838.*

Arbor 12-15-pedalis. Folia 2-2½ poll. longa, 8-9 lin. lata, membranacea, pennivenia, margine ad basim revoluta. Corolla ignota. Achænium oblongum, glaberrimum, 10-costatum. Pappus pilosus, scabridus, stramineus.

The following are the previously described species of *Albertinia* contained in my collections: n. 792, A. *capitata*, DC.; n. 4811, A. *bicolor*, DC.; n. 4813, A. *elæagnus*, Mart.; n. 4814, A. *erythropappa*, DC.; n. 4815, A. *verbascifolia*, Mart.

Chresta, *Velloz.*

Sect. 1. Euchresta, *Gardn.*

4818. C. *intermedia*; caule suffruticoso ramoso, ramis striatis velutino-tomentosis, foliis breviter petiolatis oblongo-ellipticis utrinque obtusis minute dentatis penniveniis

* This is the same as Blanchet's n. 2591, from the Serra Jacobina. —(G. B.)

reticulatis utrinque adpresse velutino-tomentosis canis, ramis versus apicem nudis capitulo globoso compacto terminatis, capitulis 2-3-floris oblongis, involucri squamis lanceolatis acuminatis extus tomentosis, achænio sericeo-villoso.

Hab. Elevated grassy Campos between the Diamond District, and the Rio San Francisco.

Suffrutex ramosus, 3-pedalis. Folia submembranacea, venosa, venis utrinque prominulis, 3-3½ poll. longa, 1½ circiter lata. Corolla violacea, lobis extus longe pilosis. Pappus sordide albidus.

When I published my paper on the genus *Chresta*, in the first vol. of the London Journal of Botany, I laid this species aside as a variety of C. *sphærocephala*, DC., but on looking at it again more particularly, I now find it to be an intermediate form between that species and C. *pycnocephala*, DC. Decandolle is wrong in saying that the corolla of C. *sphærocephala* is glabrous, both it and C. *pycnocephala*, being pilose as in the present species.

Elephantopus, *Cass.*

2643 et 4836. E. *palustris*; caule erecto ramoso angulato hirto demum glabriusculo, foliis longe lanceolato-linearibus basi dilatatis amplexicaulibus apice attenuatis obtusis minute et distanter serratis utrinque parce hirtis et minute scrobiculatis, floralibus late cordato-orbiculatis acuminatis serratis reticulatis pellucido-punctatis villosis vel glabratis.

Hab. In marshes near the city of Oeiras, Province of Piauhy, (n. 2643); and in moist places between the Rio Claro and San Romão, in the Province of Minas Geraes, (n. 4836).

Herba erecta, 2-2½-pedalis. Folia pennivenia, 6-8 poll. longa, 4-6 lin. lata. Capitula 4-flora, in glomerulum foliis cinctum dense adgregata. Involucrum compressum, biseriale, squamis oblongo-lanceolatis acuminatis subtrinervibus

extus ad apicem parce pilosis. Corolla glabra. Achænium oblongum, compressum, glaberrimum, 3-costatum. Pappus 1-serialis, paleis 8 late lanceolatis acuminatis serrulatis.

A very distinct species from any of those hitherto described.

Lagascea, H.B. et K.

Sectio 1. Lagasca, *Cav.*

2220. L. *Kunthiana*: annua, tota molliter hirsuta, foliis longe petiolatis late ovatis acuminatis serratis trinervibus, capitulis 1-floris in glomerulum foliis cinctum dense adgregatis, glomerulis oppositifoliis pedunculatis petiolo subæqualibus.

Hab. Dry Campos, near Boa Esperança, Province of Piauhy. Feb. 1839.

Herba annua, erecta, subramosa, 1-2-pedalis. Folia opposita, 4-4½ poll. longa, 1½-2 poll. lata. Petioli 12-15 lin. longi. Involucrum proprium 1-seriale, gamophyllum, tubulosum, glanduloso-striatum, 5-partitum, lobis lanceolatis acuminatis 3-nervibus. Corolla alba, extus pubescens. Achænium oblongum, compressum, glaberrimum. Pappus uniserialis, coroniformis, brevissimus, subdentato-ciliatus.

The structure of the corolla in this plant is very remarkable, the marginal veins of the laciniæ being so far removed from the margins as to be at a greater distance from them than from the axis, resembling in this respect the genus *Hymenopappus*. There is also sometimes a central vein, but slight, and I have seen none of them reach below the divisions of the limb. The fine nerves of the tube are somewhat of a glandular structure. In the following species, and in another in my herbarium, which I believe to be L. *mollis*, Cav., the veins are also distant from the margins, but not nearly so much as in the present one.

1741. L. *campestris*; herbacea tota molliter hirsuta, foliis petiolatis ovatis vel ovato-oblongis obtusis subserratis tri-

nervibus, capitulis 1-floris in glomerulum foliis parvis oblongis cinctum dense adgregatis, glomerulis oppositifoliis pedunculatis folio plerumque longioribus.

HAB. Arid Campas near Villa do Icó, Province of Ceará. Aug. 1838.

Herba annua? ramosa, diffusa. Folia superiora alterna, sub lente eleganter reticulata, 9-12 lin. longa, 3-4 lin. lata. Petioli 2 lin. circiter longi. Folia inferiora ignota. Involucrum proprium 1-seriale, gamophyllum, tubulatum, glanduloso-striatum, 5-partitum, lobis lineari-lanceolatis acuminatis uninervibus. Corolla alba, extus pubescens. Achænium oblongum, compressum, glaberrimum. Pappus uniserialis, coroniformis, brevissimus, ciliatus.

This species agrees with L. *mollis* in habit. As in that species the upper leaves are alternate from the peduncles arising opposite to them. The lower ones are no doubt opposite as in L. *mollis*, but my only specimen is unfortunately destitute of them.

LORENTEA, *Less.*

Sect. 1. CRYPTOPETALUM, *Cass.*

2215. L. *oligocephala*; caule erecto trichotomo-ramoso, ramis teretibus pubescentibus, foliis sessilibus linearibus acutis apiculatis margine subrevolutis infra medium longe ciliatis supra pubescenti-scabridis subtus nigro-glanduloso-punctatis nervo medio piloso-pubescentibus, pedunculis terminalibus subbracteatis 1-cephalis, capitulis 16-floris, involucri squamis 5 oblongis acuminatis pubescentibus, achæniis pilosis, pappo disci biseriali aristato serrato inæquali, radii 1-seriali setis 4 elongatis cæteris triplo fere brevioribus tenuioribus.

HAB. Dry Campos near Boa Esperança, Province of Piauhy. Feb. 1839.

Herba annua, erecta, 1-1½-pedalis. Folia opposita, 2 poll. longa, 2 lin. lata. Pedunculi subpollicares. Involucrum

4-lin. longum. Corolla disci lobis extus subpubescentibus.

2213. L. *affinis*; caule erecto trichotomo-ramoso, ramis teretibus striatis pubescentibus, foliis sessilibus anguste linearibus acutis apiculatis margine subrevolutis infra medium longe ciliatis supra pubescenti-scabridis subtus nigro-glanduloso-punctatis, pedunculis terminalibus bracteatis 1-cephalis, capitulis 16-floris, involucri squamis 5 oblongis acutis glabris, achæniis pilosis, pappo disci biseriali aristato serrato inæquali, radii 1-seriali setis 5 elongatis cæteris vix duplo brevioribus.

Hab. Arid Campos near Retiro, Province of Piauhy. March 1839.

Herba annua, 1-1½-pedalis. Folia 1½-3 poll. longa, lineam lata. Pedunculi graciles, 1½ poll. longi. Involucrum 3 lin. longum.

Allied to the preceding species, but essentially distinguished by the very different pappus of the florets of the ray, which affords the best character by which to recognize the species, many of which resemble each other very much.

2214. L. *ramosissima*; caule erecto trichotomo-ramosissimo, ramis gracilibus teretibus puberulis, foliis anguste linearibus acutis apiculatis glabriusculis margine infra medium longe ciliatis subtus nigro-glanduloso-punctatis, pedunculis terminalibus elongatis subbibracteatis 1-cephalis, capitulis 20-floris, involucri squamis 5 oblongis obtusis glabris, achæniis parce pilosis, pappo disci biseriali aristato serrato inæquali, radii 1-seriali setis 9 elongatis cæteris plerumque vix duplo brevioribus.

Hab. Dry Campos at Canna Brava, near Oeiras, Province of Piauhy. March 1839.

Herba annua, 1-1½-pedalis. Folia subrecurvata, 12-18 lin. longa, lineam circiter lata. Pedunculi graciles, 2-poll. longi. Involucrum 3-lin. longum.

1745. L. *polycephala*; caule erecto trichotomo-ramoso, ramis teretibus puberulis, foliis linearibus acutis apiculatis margine infra medium ciliatis supra pubescenti-scabridis

subtus nigro-glanduloso-punctatis, pedunculis axillaribus terminalibusque ad apices ramulorum congestis pluribracteolatis 1-cephalis, capitulis 15-floris, involucri squamis oblongis acutis glabris, achæniis pilosis, pappo disci biseriali aristato serrato inæquali, radii 1-seriali setis 10 elongatis cæteris duplo brevioribus.

HAB. Arid Campos near Villa do Icó, Province of Ceará. Aug. 1838.*

Herba annua, 1-1½ pedalis. Folia 1½-2 poll. longa, 1½ lin. lata. Pedunculi graciles, subpollicares. Involucrum 3 lin. longum.

2449. L. *decumbens*; glaberrima, basi suffruticulosa, caulibus adscendentibus trichotomo-ramosis, foliis sessilibus linearibus apice acutis piliferis margine fere ad apicem longe ciliatis pellucido-glandulosis, pedunculis elongatis bracteatis 1-cephalis, capitulis 30-floris, involucri squamis 8 oblongis obtusis, achæniis pilosis, pappo disci biseriali aristato serrato inæquali, radii 1-seriali setis 2 valde elongatis cæteris multo brevioribus.

HAB. Arid Campos near Pobre, Province of Piauhy. July, 1839.

Herba vix semipedalis. Radix usque ad collum lignosa. Caules 3-4, decumbentes. Folia congesta, 1-2 poll. longa, 1-1½ lin. lata. Pedunculi 2-2½ poll. longi. Involucrum 4 lin. longum.

2648. L. *congesta*; pusilla, glabra, caulibus congestis, foliis sessilibus linearibus apice acutis piliferis margine revolutis infra medium longe ciliatis subtus nigro-glanduloso-punctatis, capitulis terminalibus sessilibus 14-floris, involucri squamis oblongis acuminatis, achæniis pilosis, pappo disci biseriali aristato serrato inæquali, radii 1-seriali setis 4 elongatis cæteris paulo brevioribus.

HAB. Arid Campos near Parnagoa, Province of Piauhy. Aug. 1839.

* This appears to be the same as n. 583 (837) of Schomburgk's second collection from Guiana, and is closely allied to *Pectis elongata*, Humb. et Kunth.—(G. B.)

Herba annua, subbipollicaris. Folia 6 lin. longa, vix lineam lata. Involucrum 3 lin. longum.

Kandy, Ceylon, Sept. 22, 1844.

(*To be continued.*)

BOTANICAL INFORMATION.

ZEYHER'S *South African Plants.*

Sufficient has already appeared in this Journal respecting Mr. Zeyher, and enough also of the yet unfinished narrative of his travels,* to satisfy our readers that the collections of such a botanist can be of no ordinary character. These collections are now divided by Mr. Zeyher into three groupes.

1. Plants gathered during a journey in company with Mr. Burke, from Graham's Town to *Macalisberg* in lat. 24° south.

2. Plants gathered to the northward and westward of the Cape Colony; viz. in *Namaqua Land* and *Bushman Country.*

3. Plants gathered in the *Cape Colony.*

The first and second of these are now offered for sale, namely the plants of the *Macalisberg Journey,* and those of *Namaqua* and *Bushman's Country.* These two collections united amount to from one thousand one hundred, to one thousand four hundred, fifteen sets of each. The price of the Macalisberg plants is reckoned at £2 the hundred species; those of Namaqua and Bushman's Country at £1 10*s.* the hundred species, all expenses included. It will be observed that of the above mentioned fifteen sets, the early numbers contain the greater proportion of species from

* See vol. IV, p. 643, and the present volume of this Journal, p. 109.

Macalisberg, the latter from Namaqua and Bushman Country, the intermediate Nos. (ex. gr. 7, 8, 9) include nearly an equal quantity from both countries.

The editor of this Journal can testify to the excellent condition of the specimens, and application for sets may be made through Sir W. J. Hooker, or Mr. John Smith, Royal Gardens, Kew.

The collections of the Cape Colony are not yet ready for distribution: when they are, due notice will be given in this Journal.

Borgeau's *Canary Island Plants.*

We are glad to be able to announce that a distribution of M. Borgeau's plants of the Canary Islands, has already commenced, and two centuries of them are actually on sale, and at the very low rate of £1 the century. It must not be inferred from their moderate cost, that the specimens are proportionately indifferent. They are, on the contrary, very fine and well prepared, and of great value to our Herbaria from the circumstance of their being accompanied with correct names (for which we believe the public is indebted to Mr. Webb) on printed labels, accompanied by the locality.

Type de chaque Famille et des principaux Genres des Plantes croissant spontanément en France; exposition détaillée et complète de leurs Caractères et de l'Embryologie; par F. Plée.

We have hitherto seen only one number of this work, but that suffices to give us a favourable opinion of it. Each No. (price 1 f. 25 c. of France) contains an excellent figure, illustrative of a family, and of a genus, and species, accompanied by a suitable description and remarks. The subject before us is the *Calystegia sepium,* illustrative of the natural order *Convolvulaceæ*; and so well is this plate

executed, that we do not wonder at the expression in the "Rapport" on the work by M. Ch. Martins, when he says, " l'auteur ayant à décrire des formes et des organes, a plus souvent employé le crayon que la plume." M. Plée, indeed, seems to be perfect master of the pencil, and the drawing and colouring are equally excellent and delicate. The analysis of the flowers and fruits is complete, even to the embryo in a state of germination; and there is no confusion in the arrangement of the numerous figures. The descriptive part is also satisfactory and useful. It begins with the name and character of the natural family; then of the genus; and lastly of the species, upon which follow some remarks on other plants of the same order, especially of such as are useful in medicine, or in domestic economy. An explanation of the figures, of which there are in this instance no less than nineteen, besides the plant of the natural size, concludes the account of the natural order.

Twenty Lessons on British Mosses, by W. Gardiner, Dundee; *illustrated with specimens.*

We have already mentioned Mr. W. Gardiner of Dundee as one of the most enthusiastic of our British Botanists, and his specimens, gathered chiefly about Dundee, in the Grampian mountains, have elicited much praise from us. We have spoken favourably of his " Botanical Rambles in Braemar," and we have announced his " Flora of Forfarshire," as about to appear. Another and exceedingly interesting little pocket volume has just appeared, his " Twenty Lessons on British Mosses," a work executed with much taste and written with much good feeling, and offered at the moderate cost of half a crown. After a brief preface, follows the first Lesson, which is introductory. The second is on the structure of Mosses, and the different external parts of a moss are illustrated by a specimen itself, and a reference is made to the capsule, seta, calyptra, operculum and peristome: the remaining

eighteen Lessons are descriptive of as many species of Mosses, accompanied by specimens, and several of them are of rare occurrence. We think few will peruse this little book without desiring to know more of the family of plants of which it treats.

PHYCOLOGIA BRITANNICA; OR *History of the British Sea-weeds*, by W. H. HARVEY, M.D. M.R.I.A., &c., &c.

Four numbers of this beautiful work are already before the public, and the judgment of that public has been pronounced upon it. We believe of its merits there can be but one opinion, viz. that at no period of botanical literature has a more important contribution been made to the Flora of the British Isles than on the present occasion. Of Dr. Harvey's fitness for the descriptive portion of the work, a moment's doubt could not be entertained; but it adds infinitely to the value of the plates, to know that not only are the drawings and analysis all executed by Mr. Harvey's own hands, but the plates (lithographs) also; thus ensuring the most perfect accuracy to the figures, as well as the letter-press. The work will be completed in sixty numbers, and each number contains six coloured plates, at the moderate price of 2*s*. 6*d*. These appear without reference to systematic order, but at the conclusion of each volume, and more fully at the completion of the entire work, systematic and alphabetical indexes will be added; and finally a general introduction, to be prefixed to the last volume, will complete the history. The plates represent the natural size and magnified dissections of the species, accompanied by generic and specific characters, synonyms, British habitats, the geographical distribution and general history of each individual, in a fuller and more perfect manner, than has yet been attempted in any work exclusively devoted to the illustration of British Algæ.

We heartily wish it all the success so useful a publication merits.

Catalogue of the first Series of Plants of JAVA, *collected by* MR. TH. LOBB, *sets of which have been announced for sale by Mr. Heward, Young Street, Kensington, (see p.* 198 *of this volume)*; by M. J. E. PLANCHON.

Nos. 1 Ranunculus Javanicus, *Blume.*
2 Thalictrum Javanicum, *Blume.*
3 Clematis Leschenaultiana, *DC.*
4 Polyalthia Kentii, *Blume.*
5 Polyalthia macrophylla, *Blume.*
6 Guatteria macrophylla ? *Blume.*
7 Viola pilosa, *Blume.*
8 Hippocratea Indica, *Willd.*
9 Polygala venenosa, *Juss.*
10 Xanthophyllum (Jackia vitellina, *Blume*).
11 Hiptage Javanica, *Blume.*
12 Saurauja.
13 Schima Noronhæ, *Blume.*
14 Eurya (Geeria angustifolia, *Blume.*)
15 Sterculia subpeltata, *Blume.*
16 Helicteres hirsuta, *Lour.*
17 Grewia glabra, *Blume.*
18 Elæocarpus floribundus ? *Blume.*
19 Elæocarpus (Monocera, *J. . . .*)
20 Didymocheton nutans, *Blume.*
21 Micromelum pubescens, *Blume.*
22 Fluggea microcarpa, *Blume.*
23 Trewia macrophylla, *Blume,* non vera Trewia.
24 Quercus angustata, *Blume.*
25
26 Ficus.
27 Ficus.
28 Bragantia tomentosa, *Blume.*
29 Pisonia.
30 Litsæa.
31 Leptonium, *Griffith.*

Nos. 31* Natsiatum oppositifolium, *Planchon*, MSS.
32 Viscum.
33 Loranthus Schultesii, *Blume*.
34 Loranthus pentandrus, L. fide *Blume*.
35 Loranthus fasciculatus? *Blume*.
36 Loranthus.
37 Begonia.
38 Agapetes laurifolia? *Don*.
39 Diplycosia pilosa, *Blume*.
40 Gaultheria repens, *Blume*.
41 Gaultheria leucocarpa, *Blume*.
42 Rhododendron Javanicum, *Benn*.
42* Agapetes? coriacea? *Don*.
43 Rhododendron album, *Blume*.
44 Dissochæta cyanocarpa, *Blume*.
45 Medinilla laurifolia, *Blume*.
46 Osbeckia linearis, *DC*.
47 Eugenia? pendula? *DC*.
48 Eugenia?
49 Ampelopsis Indica, *Blume*.
50 Arthrophyllum diversifolium? *Blume*.
51 Panax Chinensis, *Blume*.
52 Paratropia.....
53 Jonesia Asoca, *Roxb*.
54 Desmodium.
55 Uraria crinita, *DC*.
56 Acacia polycephala, *Grah*. in Wall. Cat.
57 Cerasus, C. Martabanicæ, *Wall*. Cat. proxima.
58 Rubus Celebicus?? *Blume*.
59 Rubus rosæfolius, *Lin*. R. Javanicus, *Blume*.
60 Rubus pyrifolius, *Smith*.
61 Rubus.
62 Rubus Lobbianus, *Hook*.
63 R. alceæfolius, *Poir*.
64 Rubus.
65 Primula imperialis, *Jungh*.
66 Lysimachia.

Nos. 67 Embelia Javanica, *Alph. DC.*
68 Bæobotrys virgata ? *Alph. DC.*
69 Ardisia purpurea ? *Blume.*
70 Ardisia sanguinolenta ? *Blume.*
71 Ardisia fuliginosa, *Blume.*
72 Aganosma Blumei, *Alph. DC.*
73 Leucodermis Javanica, *Planchon,* MSS.
74 Gentianea.
75 Gentianea.
76 Cyrtophyllum speciosum, *Blum.*
77 Fagræa morindæfolia, *Blume.*
78 Fagræa auriculata, *Jack.*
79 Fagræa lanceolata, *Blume.*
80 Hoya.
81 Asclepiadea.
82 Asclepiadea.
83 Asclepiadea.
84 Asclepiadea.
85 Rubia Javana, *DC.*
86 Psychotria ?
87 Pavetta.
88 Pavetta.
89 Pavetta macrophylla, *Blume.*
90 Ixora salicifolia, *Blume.*
91 Gardenia ?
92 Rubiacea.
93 Knoxia lineata, *DC ?*
94 Rubiacea.
95 Mussænda acuminata, *Blume.*
96 Rubiacea.
97 Sambucus Javanica, *Blume.*
98 Viburnum lutescens ? *Blume.*
99 Nauclea.
100 Uncaria pedicellata ? *Roxb.*
101 Uncaria.
102 Lerchea longicaada, *L.* Benn. Pl. Jav. rar.
103 Gnaphalium luteo-album, *L.*

Nos. 104 Composita.
105 Campanumæa Javanica, *Blume.*
106 Lobelia cæspitosa, *Blume.*
107 Lobelia montana ? *Blume.*
108 Agalmyla staminea, *Blume.*
109 Æschinanthus pulchra, *Steud.*
110 Æschinanthus longiflora, *Blume.*
111 Loxonia acuminata, *Blume.*
112 Loxotis obliqua, *Blume.*
113 Monophyllea, *Bl.*
114 Scrophularinea.
115 Scrophularinea.
116 Scrophularinea.
117 Scrophularinea.
118 Scrophularinea.
119 Scrophularinea.
120 Scutellaria.
121 Boraginea.
122 Labiata.
123 Sphenoclæa Zeylanica, *L.*
124 Acanthacea.
125 Acanthacea.
126 Amomacea.
127 Aroidea.
128 Aroidea.
129 Palma.
130—140 Gramineæ.
141—196 Orchideæ.
197 Polypodium, (Dipteris Horsfieldii, *Br.*)
198 Gymnopteris Vespertilio, *Hook.*
199 Lindsæa heterophylla, *Dr.* (L. Javanica ? *Bl.*)
200 Polybotrya marginata, *Bl.*
201 Trichomanes maximum, *Bl.*
202 Trichomanes meifolium, *Bory.*
203 Davallia gracilis, *Blume.*
204 Lindsea, *Blume.*
205 Helminthostachys dulcis, *Kaulf.*

Nos. 206 Pteris longipes, *Don? Blume.*
207 Psilotum complanatum, *Sw. Blume.*
208 Aspidium (Lastræa).
209 Davallia pinnata, *Cav.*
210 Gymnopteris spicata, *Pr.* (Hymenolepis ophioglossoides, *Kaulf.*)
211 Polybotrya cicutaria, *Blume.*
212 Adiantum pulchellum, *Blume.*
213 Adiantum lunulatum, *Burm.*
214 Aspidium (Lastræa) ?
215 Pteris (Litobrochya) aurita, *Blume.*
216 Synaphlebium davalloides, *Blume.*
217 Lindsæa adiantoides, *J. Sm.*
218 Polypodium (Drynaria) incurvatum, *Blume.*
219 Ophioglossum reticulatum, *Sw.*
220 Davallia elegans, *Sw.*
221 Diplazium (Callipteris) Malabaricum, *Spr.*
222 Polystichum ?
223 Polystichum ?
223*Asplenium calophyllum, *J. Sm.*
224 Nephrodium.
225 Davallia pentaphylla, *Blume.*

Description d'un genre nouveau, voisin du CLIFTONIA, *avec des observations sur les affinités des* SAURAUYA, *des* SARRACENIA, *et du* STACHYURUS. *Par* J. E. PLANCHON, *docteur-ès-sciences.*

(*Avec une Planche,* TAB. IX).

PURDIÆA, *Planch.*

CHAR. GEN. *Calyx* scariosus, persistens, 5-phyllus, foliolis 2 lateralibus externis (alis) maximis, oblique ovatis, inæqualibus, postico parvo lineari, anticis approximatis, altero postico conformi, altero duplo majore, oblique lineari-lanceolato. *Petala* 5, æqualia, lanceolata, acutiuscula, decidua. *Stamina* 10 subæqualia; *antheræ* lineari-oblongæ

filamento subulato supra medium dorso affixæ, oscillantes, basi acutæ, loculis 2 connectivum angustum marginantibus, latere sulco exaratis, utroque poro-apicali, subpostico pollen fundente. *Ovarium* quadriloculare, 4-ovulatum; *ovula* anatropa, sub apice loculorum appensa; *stylus* filiformis, apice incurvo acuto inconspicue stigmatosus. *Nucula* calice parum mutato adpresso tecta, quadrilocularis. *Semina* loculum non replentia, integumento tenuissimo subflocoso albicante, albumini carnoso adhærente, embryonis parvi recti, radicula, supera cotyledonibus longiore.

Frutex Novo-granatensis, *habitu arbutaceo*, ramis *denudatis*, foliis *ramulos dense vestientibus*, *patenti-erectis*, *alternis*, *exstipulatis*, *sessilibus*, *integris*, *rigidis*, *glaberrimis*, *nervo medio rubente subtus prominulo*, *lateralibus intra reticulum nervulorum vix conspicuis*, racemo *terminali eleganter incurvo-nutante*, *propter calices scariosos imbricatos amentaceo*, pedicellis *supra medium articulatis*, *basi bractea arida stipatis*, petalis *roseis*, *alam calicis maximam subæquantibus*.

Speciem generis unicam quæ

Purdiæa *nutans* (Tab. IX).

in regno Novo-Granatensi, prope pagum *La Cruz*, augusto florentem et fructiferam legit Cl. Purdie, cujus laboriosa merita pignore levi memorare voluminus.

(V. sicc. in herb. patroni mei generosissimi Cl. Hooker).

Le genre que je viens de décrire établit une connexion évidente entre la supposée famille des Cyrillées et le vaste groupe dont les Vacciniées, les Ericinées et les Epacridées constituent des coupes naturelles. La texture ferme et reticulée des feuilles, la grappe élégamment penchée qui termine les rameaux, les bractées scarieuses qui accompagnent et cachent en partie les pédicelles, tous ces caractères d'ensemble qui frappent dans le *Purdiæa*, se retrouvent aussi littéralement reproduits chez le *Cliftonia* (*Mylocarium*, Muhl.) qu'ils le sont avec de légères nuances chez les *Andromeda*, les *Arbutus* et surtout l'*Epigæa*. Les pétales libres et embri-

qués dans le bouton rattachent aussi bien le nouveau genre aux *Pyroles* qu'aux *Cyrillées*; ses anthères oscillantes, pointues à leur base et ouvertes au sommet par deux pores sont justement celles des *Pyroles*; son fruit au contraire qui est sec, indéhiscent et à quatre loges monospermes concourt avec tous les autres caractères pour fixer sa place à côté du *Cliftonia*.

Guidé par cette sagacité merveilleuse qui lui a fait si souvent devancer l'observation exacte, A. L. de Jussieu rangeait le *Cyrilla* parmi les *Ericinées*, sans connaître les chaînons intermédiaires qui établissent ses rapports avec ces plantes. Le *Cliftonia* qui vint naturellement se placer près du *Cyrilla* jette peu de jour sur ses affinités; l'*Elliottia*, au contraire, suffisait pour justifier l'heureuse hardiesse de Jussieu et engager les auteurs du *Flora of North America*, à réunir ces trois genres comme une section des Ericinées. L'opinion de ces savants auteurs a été adoptée dans le supplément du genera d'Endlicher; mais, par inadvertance, l'*Elliottia*, au lieu d'être énuméré parmi les Cyrillées, reste dans la première partie de l'ouvrage, à côté des *Clethra*, qui s'en éloignent par leurs capsules polyspermes.

Le triple caractère de pétales libres, anthères sans appendices et fruit à loges monospermes fournit un diagnostic assez tranché des Cyrillées, quoique ces mêmes caractères pris isolément aient ailleurs une valeur à peine générique. Peut-être même faudra-t-il, plus tard, admettre dans cette section un genre à loges du fruit polyspermes, si le *Stachyurus* de la Flore du Japon vient prendre place à côté du *Cliftonia*. Ce rapprochement que j'indique avec réserve, faute de pouvoir consulter en ce moment l'ouvrage où le *Stachyurus* est figuré et décrit avec détail, sera je suppose, confirmé par ceux qui peuvent comparer les deux genres.

Une affinité que j'indique avec plus d'assurance, parce qu'il m'est permis de parler *de viso*, est celle des *Sarracenia* et des *Pyrola*. Un coup d'œil sur ces genres avec l'intention de les comparer dévoile entr'eux des points de contact si nombreux qu'il ne saurait rester un doute sur leur affinité

immédiate. Qu'on rapproche, par exemple, un *Sarracenia* et le *Pyrola uniflora.* Leur mode de végétation est identique. Les parties de la fleur et les trois bractées qui en embrassent le calice s'accordent exactement dans leur disposition réciproque et même dans les formes; la remarquable texture de la membrane qui forme les anthères, le mode d'insertion de ces organes au filet, la composition du fruit et des graines, tout concourt à établir entre ces genres une proximité d'autant plus satisfaisante, que la place des *Sarracenia* restait encore un problème à résoudre. M. Lindley, il est vrai, a eu une idée assez heureuse en les rapprochant des Droseracées par l'intermédiaire du *Dionæa.* Loin de combattre cette opinion, je pourrais au contraire l'appuyer, en établissant un parallèle entre le *Monotropa* et ses analogues et le *Dionæa* et les Droseracées. Mais ce serait m'égarer trop loin de mon sujet, et m'exposer à être mal compris par crainte de m'expliquer trop longuement. Aussi en attendant de reprendre cette question, je la laisse à ceux qui ne *comptent* pas les caractères, mais qui les pèsent, en donnant à l'habitus une importance qui lui est trop souvent refusée.

On est surpris, par exemple, que les ressemblances d'aspect si frappantes entre les espèces Péruviennes de *Clethra* et les *Saurauja* des mêmes régions, n'aient pas fixé l'attention sur les coincidences de leurs caractères. Les mêmes rapports d'aspect auraient dû plus tôt faire établir un parallèle entre les espèces de *Saurauja* de l'Inde dont les fleurs naissent sur la portion nue des rameaux et les *Dillenia* qui présentent une végétation analogue; on aurait pu saisir entre ces genres des rapports très réels, quoique insuffisants pour les réunir dans le même groupe naturel, ainsi que l'a fait M. Lindley, dans l'ouvrage plein d'intérêt et d'utilité qu'il vient de donner à la science. Il est bien remarquable qu'un genre incontestablement naturel flotte entre deux affinités en apparence contradictoires et qu'on puisse être porté à le rapprocher des Ericinées ou des Dilleniacées, suivant qu'on a sous les yeux les représentants d'une Flore Américaine, ou ceux de la Flore de l'Inde Orientale. Mais, la complication et la singularité

s'augmentent, si l'on reconnaît aux *Saurauja* une autre affinité incontestable, celle qu'on leur a jusqu'ici presque exclusivement attribuée, avec les *Eurya* et les *Cleyera*. C'est même là que je voudrais laisser ce genre, en attendant qu'une revue des Ternstrœmiacées en définisse mieux les sections et les vrais limites.

Pour conclure cet article, il me reste à tracer les caractères de la section des Cyrillées et la diagnose des genres qui s'y rattachent, en indiquant outre leurs affinités immédiates, les rapports moins directs qu'ils présentent avec d'autres familles. Pour cela je reprends la langue dont la forme concise se prête le plus heureusement à un résumé descriptif.

Sub Ericearum signis, vix non promiscuè militant *Ericeæ* et *Rhododendra*, Juss,; *Pyrolaceæ*, et *Monotropaceæ*, Lindl. nuper, titulo non probato, in regna propria segregatæ, *Sarracenieæ*, La Pyl. huc usque, lege dura, a sedibus longe exules; demum genera *Cyrillæ* affinia propriam sectionem sistentes nempè,

Cyrilleæ, *Torr. et Gray.*

Ericeæ petalis liberis, antheris inappendiculatis, fructu indehiscente, (an semper ?), loculis monospermis.

Quas notas sectionis differentiales charactere naturali generum fusius illustrare licebit.

Genera huc certè referenda, sunt *Cyrilla*, *Cliftonia*, *Purdiæa*, *Elliottia*. *Stachyurus*, Sieb. et Zucc. a sectione recedit loculis fructus uniseriatim polyspermis, in aliis plane conveniens, ut vix de affinitate proxima dubitaverim.

Char. generum naturale.

1. Cyrilla.

Calyx minimus, 5-dentatus : *petala* 5, subcoriacea, acuta : stamina 5, petalis alterna, filamentis crassis subulatis, antheris bilocularibus, lateraliter dehiscentibus : *discus* nullus : *ovarium* biloculare, biovulatum, stylo brevi apice bidentato dentibus stigmate punctiformi notatis. *Fructus*

maturus mihi non suppetens, ex auct. capsula carnosa, bivalvis, quod potius ex ovario valde accreto baccam siccam dipyrenam, pyrenis, si quidem ab axi solutis, indehiscentibus, facile crediderim.

Frutices *glaberrimi*, foliis *versus apicem ramulorum congestis, rigidis, integerrimis, nervoso-reticulatis*, racemis *spiciformibus, gracilibus, strictis, foliorum fasciculo intermixtis, vel subjectis*, floribus *minutis, pedicello brevi bractea minuta acuta basi stipatis.*

Obs. I.—Species verisimiliter plus quam 2, sed difficillime extricandæ; unica Americæ septentrionalis incola (cujus C. *parvifolia*, Shuttl. videtur mera varietas), altera per Insulas Antillanas, Jamaicam! Dominicam! diffusa (sed forsan hic 2 latent.) Genus tandem inter plantas Guayanenses Cl. Schomburgkii occurrit, sed ex specimine manco nihil de specie certum est.

Obs. II.—Mira calicis, petalorum, ovarii, nec non habitus generalis similitudo inter *Cyrillam* et *Caraïpam leiantham*. Benth. (quæ structura antherarum singulari a *Caraïpis* veris discrepat), observanda, affinitatem classis Bicornium et Ternstrœmiacearum jam ex *Clethra* et *Saurauja* comparatis obviam, signo novo illustrat.

2. Cliftonia, Banks, (Mylocarium, *Muhl.*)

Calyx minutus, 5-dentatus, *petala* 5 obovata, calice multo majora submarcescentia, demum decidua: *stamina* 10, filamentis crassis, supra medium abrupte coarctatis et subbidentatis, antheris bilocularibus, lateraliter dehiscentibus: *discus* nullus vel obsoletus: *ovarium* 4-loculare, quadriovulatum, stigmate subsessili obsolete quadrilobulato-coronatum. *Drupa* (fide Gærtn. fil. Carp. III. p. 246, tab. 225,) exsucca, 4-alata, 4-locularis: *semina* in loculis solitaria, ex apice anguli centralis pendula, anatropa, integumento tenui, albumini carnoso adhærente, embryonis in axi albuminis recti, cylindrici, radicula cotyledonibus breviore.

Frutex *Boreali-Americanus*, foliis *alternis, versus apicem ramulorum approximatis, brevissime petiolatis, margine revo-*

luto, integerrimis, subtus glaucescentibus, racemis *nutantibus, bracteatis.*

Obs.—Genus *Purdiaæ* inter affinia proximum. Habitus quodammodo *Ilicineus*; Fructus et imprimis seminum fabrica *Cyrilleæ* ut observatum est, ad *Ilicineas* tendunt.

3. Purdiæa, *Planch.*

Char. supra fuse exposito, pauca hic quæ addantur, remanent. Ovula anatropa, micropyle valde dilatato hiante, integumento simplicissimo, nucleo subjecto adherente, superficie albescente subfloccosa. Ramulorum summitates cortice lævi, crassiusculo, vitellino indutæ, circa foliorum insertionem impressam subtumente.

4. Elliottia, *Muhl.*

Calyx minutus, 4-dentatus, petala 4, lineari-oblonga, marginibus inferne valvatis subcohærentibus apice anguste imbricatis: *stamina* 8, filamentis subulatis, antheris bilocularibus, loculis rima introrsa basim non attingente hiantibus: *discus* tumidus: *ovarium* 4-loculare, ovulis in loculo-solitariis, amphitrope curvatis, angulo centrali peritrope insertis: *stylus* longus basi compressus, apice curvatus: *stigma* e lobulis 4 minutis margine tenui indusiatis (ut in Azalea et plerisque Ericineis): *fructus*. . . . . .

Frutex *Boreali-Americanus, habitu Befariam potius quam Clethram referens,* foliis *alternis, petiolatis, utrinque acutis, subtus subglaucescentibus,* racemo *terminali recto, laxifloro, floribus longiuscule pedicellatis.*

Explic. de la Planche IX. *Purdiæa nutans,* Pl. un rameau florifère. Fig. 1. Une fleur vue dans sa partie antérieure, un peu plus étalée que dans l'état naturel; *f.* 2. la même, beaucoup plus étalée; *f.* 3. calice isolé, dans sa position normale; *f.* 4. une étamine; *f.* 5. ovaire; *f.* 6. le même, coupé de manière à ne montrer que deux de ses quatre loges; *f.* 7. un ovule, (le micropyle est très dilaté); *f.* 8. une graine; *f.* 9. embryon. Tous les détails sont plus ou moins grossis.

On THYSANOTHECIUM, *a new genus of Lichens, by* C. MONTAGNE, D.M., *and the* REV. M. J. BERKELEY, M.A., F.L.S.

(*With a Plate,* TAB. X.)

The remarkable production here characterised formed part of an extensive collection of Swan River Cryptogams sent to Sir W. J. Hooker by Mr. Drummond. The older individuals, though their affinity to the great division of Lichens is very evident, bear a very striking resemblance to *Cantharellus undulatus*, Fr. Unfortunately no sporidia have been detected; the series of specimens is, however, too perfect to allow of the supposition that it is merely a strange form of some well known genus.

THYSANOTHECIUM, *Mont. and Berk.*

Apothecia terminalia, libere enata, primitus orbicularia plana, margine sinuoso integro, demum flabellari-expansa, obliqua, maxima, lobata, lobis oblongis. *Discus* tandem immarginatus (excipulo nullo receptus) thallo subconcolor, pallidus, strato gonimo impositus. *Asci* imperfecti. *Thallus* duplex; verrucæ sparsæ a quibus surgunt frondes verticales tereti-compressæ, cartilagineo-corticatæ, rimoso-plicatæ solidæ, intus filamentosæ.—HAB. ad ligna adusta necnon ad terram nudam in regione Australasiæ, Swan River dicta.

Thysanothecium *Hookeri*.—Drumm. n. 69, 70.

The genus has somewhat the habit of *Ramalina*, to which it is analogous, in the position of the proligerous lamina and the nature of the thallus, but it is very different in the mode of evolution and the form of the apothecia. These are formed at an early period on the tips of the fronds, and they might then be taken for those of a *Stereocaulon*. They may be distinguished, however, by the absence of an excipulum. They lose gradually their orbicular form, and are developed unequally, so as at last to appear fixed to the thallus by a single point of their circumference, the remainder being

divided into flabellate lobes. It is certainly an anomalous genus, like many others of its compatriots.

The colour varies from a pale yellowish-green, or grey, to brown. The podetia in n. 70 do not exceed 2 lines in height, and the warts of the lower part of the thallus are smaller, while in n. 69 they are sometimes half an inch high.

TAB. X.—FIG. 1. Young, and *f.* 2. full grown plants, *nat. size; f.* 3. young thallus and podetia; *f.* 4. older ditto; *f.* 5. vertical section of ditto; *f.* 6. podetium; *f.* 7. portion of apothecium; *f.* 8. ditto, more advanced; *f.* 9. asci;—*more or less magnified.*

New HEPATICÆ; *by* THOMAS TAYLOR, M.D.

Having been permitted by Sir William J. Hooker the agreeable privilege of examining the *Hepaticæ* of his most extensive and valuable collection, and allowed the liberty of publishing the undescribed species, I propose, in the following papers, to give specific characters and short diagnostic descriptions of those that appear to me new. A few are added from my private Herbarium and from those of other kind friends.

1. GYMNOMITRION, *Nees.*

1. G. *atrocapillum,* Hook. fil. et Tayl.; caule tenuissimo, implexo, procumbente, subramoso, flexuoso; foliis distantibus, erectis, adpressis, concavis, ovato-quadratis, eroso-emarginatis, integerrimis; perichætialibus majoribus imbricatis in capitulum congestis.

HAB. On clay, at an elevation of 600 feet, Foul Haven, Kerguelen's Land, May, 1840, *Dr. Joseph D. Hooker.*

Patches loose, 1-2 inches wide. Stems black, slender as horse-hair, the sterile nodulose with distant concave adpressed leaves, whose emarginate summits are browner than the remaining parts; perichætial stems pale olive-brown,

clavato-rotundate at their tops, which are twice as wide as the inferior part of the shoot. Perichætial leaves more imbricated, more concave and rounder than the cauline; within the *perichætium* was found a pair of minute whitish, scariose, very connivent scales, but neither *calyptra* or barren *pistilla* were present.

2. Plagiochila, *Nees* et *Mont.*

1. P. *elata*, Tayl.; caule laxe cæspitoso, elongato, erecto, flexuoso, apice incurvo, subramoso; foliis arcte imbricatis, erecto-patentibus, secundis, dimidiato-cordatis, latis, ciliato-spinosis, margine superiori recurvo; calyce demum axillari, oblongo, subincurvo, compresso, truncato, dentato.

Hab. Chiloe; n. 1449, *Cuming, Hook. Herb.*

Tufts wide, olive-brown. Stems 5 inches high, prolonged by one or two annual branches. Leaves, even when moistened, secund, more erect than patent, the inferior portion gibbous and more strongly ciliated. Perichætial leaves similar to, but larger than the cauline. Calyx obovate, truncate, compressed before flowering and, contrary to what is common in the genus, less strongly ciliated than the leaves. This species is far a larger plant than P. *biserialis*, Lind., its leaves are by no means decurrent, and the calyx is dentate, not subentire.

2. P. *Pichinchensis*, Tayl.; caule laxe cæspitoso, adscendente, basi ramoso; surculis complanatis, simplicibus; foliis subimbricatis, patentibus, oblongo-ovatis, obtusiusculis, dentato-ciliatis, margine superiori recurvo, decurrente, inferiori basi rotundato, subgibboso; calyce demum axillari, oblongo, campanulato, ore aperto, ciliato, hinc alato, ala lineari, dentata.

Hab. Woods of Pichincha; n. 334. *Prof. W. Jameson.*

Tufts loose, pale olive green. Stems 2-3 inches high, several from the same point, hence appearing fascicled; shoots simple, very slightly curved. Leaves scarcely imbricated, very thin. Calyx with its sides equal, the base rounded and full, the mouth shortly two-lobed, ciliated. Pedicel twice as

long as the calyx, very pale olive green. Capsule elongato-ovate. Seeds and spiral filaments fixed on the inner surface of the valves. This fine species approaches another Alpine and Tropical one, *Jung. cristata,* Swartz, from Jamaica; differing by the more simple shoots, the wider and less imbricated leaves, their more distant but stronger ciliation, and by the absence of elongated declining shoots, radicating at their summits.

3. P. *Chonotica,* Tayl.; caule laxe cæspitoso, surculis erectis, basi subnudis, subramosis, complanatis; foliis imbricatis, erecto-patentibus, ex angusta basi oblongis, rotundatis, convexis, margine utroque recurvo atque spinoso-dentato.

Hab. Chonos Archipelago. n. 434. *Darwin, Hook. Herb.*

Tufts pale tawney. Stems 2-3 inches high, dendroid or naked and simple below. The *perigonia* are small, short, simple linear spikes, whose leaves are minute, closely imbricated, tumid, denticulate. It has some resemblance to P. *fasciculata,* Lind., but the shoots of this are much narrower, the leaves shorter, more distantly and more minutely toothed, the branches fascicled, and the cells of the leaves much more minute.

4. P. *Amboynensis,* Tayl.; surculis laxe cæspitosis, erectis, vage ramosis, complanatis; foliis imbricatis, erecto-patentibus, late acinaciformibus, obtusis, margine inferiori dentato-ciliato, superiori integerrimo, recurvo; perichætialibus calyce longioribus suberectis; calyce terminali, ovato, compresso, hinc fisso, ciliato.

Hab. Amboyna, *Webb. Hook. Herb.*

Tufts loose, tawney olive. Shoots 1-2 inches high, dendroid, straight, subpinnate, complanate. Leaves perichætial leaves and calyx dentate above and ciliated beneath on the inferior margin. Calyx browner and shorter than the *perichætium.* The outline of the shoot resembles that of P. *javanica,* Nees et Mont., but the present is a smaller and browner species, with larger leaves, more ciliated at the base of the inferior margin, while the calyx is much shorter.

5. P. *Dillenii,* Tayl.; caule repente, surculis confertis, erectis,

subramosis; foliis imbricatis, erecto-patentibus, convexis, obovatis, decurvis, denticulatis, marginibus recurvis; calyce terminali, ex angusta basi oblongo, apice compresso, perichætium superante, ore subtruncato, dentato.

HAB. Sides of streams in mountain woods, common in Ireland, *Dill. Musc.* p. 483, t. 69, f. 6, A. B. C.

Tufts loose, pale olive-green. Shoots 1-2 inches high, more rarely as long as in the Dillenian figure. Calyces obliquely and roundly truncate; the fertile much larger than the barren. Capsule oblong. Pedicel thick, about as long as the shoots. Differs from *Jung. asplenioides*, L., by the smaller size, darker colour, the more imbricated, more erect, more convex and narrower leaves, and by the calyx more covered by the *perichætium*.

6. P. *punctata*, Tayl.; surculis cæspitosis, erectis, ramosis; foliis punctatis, subapproximatis, patentibus, rotundato-ovatis, recurvato-convexis; calyce demum axillari, ex angusta basi late obovato, compresso, hinc fisso, illinc alato, ala denticulata, ore rotundato, spinoso-ciliato.

HAB. In Ireland, common. Canaries, *Lemann, Hook. Herb.*

Tufts dense, about 1 inch high, yellowish-olive. Lower leaves very small. Calyces short. *Perigonia* in terminal oblongo-ovate spikes, of 4 or 5 pairs of widely ovate, obtuse, dentate leaves, whose anterior margins are inflexed on the solitary anthers. Differs from *Jung. spinulosa*, Dicks, by the smaller size, the patent leaves, which are not decurrent, and are punctato-cellulose; by the shorter calyx and by the more frequent flagelliform shoots.

7. P. *orientalis*, Tayl.; surculis cæspitosis, erectis, subramosis; foliis subapproximatis, patentibus, lineari-obovatis, margine recurvis, subdecurrentibus, apice 2-3-4-dentatis; perichætiis demum axillaribus, majoribus, calyce brevi, obovato, truncato, ciliato duplo longioribus.

HAB. Nepal, *Wallich, Hook. Herb.*

Tufts loose, nearly 2 inches high, tawney-olive. Leaves convex, nearly patent, sometimes with but 2 spinose teeth at their tops, usually, however, with 3 or 4. *Perichætia*

of two erect, rotundato-ovate, dentato-ciliate leaves. The calyces observed were not fertile, bearing barren *pistilla*, shortly obovate, with a wide obliquely truncate mouth, the higher part of which was the more strongly ciliated. Ours resembles P. *pectinata*, Lindl. It differs by the pale colour, wider shoots, wider bases of the leaves, which are more convex, their denticulation more spinous, their cells are wider. In P. *tenuis*, Lind., likewise from Nepal, the perichætial leaves are far shorter than the calyx, and the cauline leaves are more distant and more minute.

8. P. *Kamounensis*, Tayl.; surculis cæspitosis, erectis, subramosis, subtus hirsutis, apice incurvis; foliis imbricatis, subpatentibus, secundis, convexis, dimidiato-cordatis, basi lucido-nerviis, margine superiori decurrente, inferiori sinuato-crispo, utrisque recurvis, dentatis.

HAB. Kamoun. *Wallich, Hook. Herb.*

Tufts rather loose, brownish-olive, scarcely 2 inches high. Shoots simple, but usually rising in pairs from the same point; their inferior side beset with numerous, flat, simple filaments, which resembling roots, yet are placed on shoots not touching the ground. Leaves dentate round their entire margin; the lower leaves minute. From P. *corrugata*, Lind. the present is at once distinguished by the absence of stipules, by the root-like filaments on the inferior side of the shoots, the smaller but more extended denticulation of the leaves as well as by the pale yellow, transparent, elongated spot at the middle of their bases, representing a nerve.

9. P. *deflexirama*, Tayl.; caule laxe cæspitoso, erecto, pinnato; ramis distantibus, complanatis, subsimplicibus, deflexis, foliis subimbricatis, patenti-decurvis, dimidiato-oblongo-ovatis, obtusis, spinoso-dentatis, margine dorsali decurrente, basi recurvo, ventrali subcristato; calyce terminali, immerso, oblique, semirotundo, compresso, hinc basin usque fisso, inciso-ciliato.

HAB. No. 320, on trunks of trees, Pichincha. *Prof. W. Jameson.* No. 110, Peru. *Hook. Herb.*

Pale yellowish olive. Stems 7-8 inches long, smooth,

slightly flexuose. Denticulation of the leaves strong, the terminal spinous. Calyx terminal on branches. *Perichætium* large. This is a larger species than P. *abietina*, Nees, its habit loose and light, the branches are more simple, the leaves longer and less imbricated, besides the calyx is terminal on longer branches, is split down to the base on one side, and furnished all round the mouth with dense elongated ciliæ.

10. P. *ærea*, Tayl.; caule debili, tenui, pendente, subramoso; foliis distichis, planiusculis, distantibus, patentibus, lineari-lanceolatis antice apiceque elongato-ciliatis; calyce axillari, oblongo, subincurvo, apice demum hiante, ciliato, hinc fisso, basi nudo.

Hab. On trees in the Forest of Esmeraldas, *Prof. W. Jameson, Dr. Greville's Herb.* 1827.

Five to six inches long, tawney, very light and slender. It has all the habit of P. *bursata*, Lind., whose var. β. it is made at page 88, of his *Species Hepaticarum*; it is, however, very distinct by its slenderer habit, by the ciliation of the leaves extending all along the inferior margin, and by the base of the calyx uncovered by leaves, whilst the calyx itself is more elongated.

11. P. *fusco-lutea*, Tayl.; caule laxe cæspitoso, erecto, dichotomo, surculis complanatis; foliis laxe imbricatis, patentibus, ex lata basi ovatis, obtusis, apice subbidenticulatis, margine dorsali decurrente, recurvo, ventrali subcristato; calyce terminali, elongato-obovato, subtruncato, subdenticulato.

Hab. Peru. *Prof. W. Jameson, Hook. Herb.*

Olive brown, stems 3-4 inches high, divaricato-dichotomous; shoots more than a line wide. Leaves minutely cellular. Calyx one fifth of an inch long, often entire at the mouth; the two years old calyx axillary. Pedicell exserted as long as the calyx. Capsule oblongo-ovate, valves wide. This has some affinity to P. *subintegerrima*, Nees, but is a larger plant, with more imbricated leaves, which are not at

all decurved, and are more attenuated above. The calyx too is subtruncate and its mouth nearly entire.

12. P. *fissidentoides*, Tayl.; surculis laxe cæspitosis, erectis, simplicibus; foliis alternis, distichis, approximatis, patentibus, planis, lineari-oblongis, obtusissimis, apice dentatis.

HAB. Sandwich Isles. *Menzies.*

Very pale olive brown, shoots about 1½ inches high, widest in the middle, anterior and posterior margins of the leaves nearly paralel. The simple, shorter shoots and wider leaves destitute of ciliæ, easily distinguish this from P. *bursata*, Lind.

13. P. *phalangea*, Tayl.; caule cæspitoso, erecto, fasciculato, ramis dichotomis, strictiusculis; foliis arcte imbricatis, erecto-patentibus, secundis, semicordatis, obtusis, dentatis, margine dorsali subrecurvo, decurrente, ventrali cristato, gibboso.

HAB. Nepal. *Wallich*, 1820.

Tufts olive-brown, stems slender, two inches high. Leaves convex, their denticulation short and at irregular distances. The present differs from P. *semidecurrens*, Lind., by the want of fibrils to the stems, and by the narrower tops of the leaves; and from P. *Nepalensis*, Lind., by the more decurrent leaves, which are more minutely denticulate; and from both by the close imbrication of the secund foliage.

14. P. *exigua*, Tayl.; caule cæspitoso, erecto, crassiusculo, subramoso, flagellifero; foliis distantibus, patentibus, ex angusta basi rotundato-ovatis, bifidis, integerrimis, segmentis sinuque subacutis, margine dorsali subrecurvo, ventrali subgibboso, subdenticulato.

HAB. On trees at Cromaglown, and wet rocks at Knockavohila, County Kerry.

Tufts dense, short, olive. Stems scarcely ¼ inch high, usually naked above, except at the very summit where a flattish *capitulus* of leaves occurs. Leaves remote, the base very narrow, hence easily detached from the stems; the

rudiments of two or three are frequently visible at the base of the ventral margin. Cellules large; no fructification detected; hence some doubts exist as to the genus. It is referred to *Plagiochila* because of the recurved margin at the base of the leaves on the upper side, while that of the inferior is subdenticulate. It is allied to P. *tridenticulata,* Tayl., by its small size and flagelliform shoots, and abundantly distinguished by the shallower division of the shorter, less acuminated leaves, which are more potent and have smaller cellules.

15. P. *ensiformis,* Tayl.; surculis elongatis, simplicuisculis, adscendentibus, recurvis; foliis majoribus, imbricatis, patentibus, dimidiato-cordatis, obtusissimis, subdecurrentibus, apice subtridenticulatis, cæterum integerrimis, marginibus ventralibus conniventibus, dorsalibus reflexis.

HAB. Columbia. *Prof. W. Jameson.*

Loosely cæspitose. Branches 6-8 inches long, nearly ¼ inch wide, bending back, brownish-olive. Leaves complanate, sometimes in the upper parts of the shoots secund, broadly ovate and gibbous anteriorly, nearly opposite. It is allied to P. *Hochstetteri,* Lind., and differs by the simple branches, less imbricated and less decurrent leaves, which are of greater size and lighter colour.

16. P. *dependula,* Tayl.; surculis elongatis, laxe cæspitosis, simplicibus, decurvis; foliis laxe imbricatis, suboppositis, erectis, adpressis, ellipticis, integerrimis, postice decurrentibus, marginibus subflexuosis, subincurvis.

HAB. East side of the Cordilleras, Peru. *Prof. W. Jameson.*

Shoots tawney olive, the tops recurved or hanging down; nearly simple. Leaves in two opposite series, pressed together into the same plane, and nearly concealing the stem, wider than long, very obtusely angular at the top but quite entire. *Perigonia* are narrow oblong spikes in the course of the shoots. It is judged to be a *Plagiochila* from its close resemblance to P. *ansata,* Hook. fil. et Tayl. from Falkland Island.

It is, however, far larger, reaching 7-8 inches in length, has the leaves wider, but the decurrent part not so wide.

17. P. *atro-virens*, Tayl.; caule disperso, surculis erectis, subramosis, apice incrassatis; foliis arcte imbricatis, erectis, secundis, ex angusta decurrente basi obovatis, apice divaricato-spinosis, margine ventrali dentatis, dorsali recurvis; perichætiis axillaribus, eorum foliis majoribus, latioribus, spinosis.

Hab. A scrap picked off a Lichen from Pichincha. *Prof. W. Jameson.*

Shoots straggling, dark green, 1-2 inches high. Leaves on their upper part with divaricating spines as in *Gymnanthe Wilsoni*, Tayl., but on the inferior margin simply dentate. It is allied to P. *decipiens*, Lind., by its size, colour and habit, but differs essentially by the recurved dorsal margin of the leaves, these, besides are secund, and have the ventral margin dentate.

18. P. *pallentifolia*, Hook. fil. et Tayl.; caule cæspitoso, adscendente, subramoso; foliis imbricatis, erecto-patentibus, concavis, oblongo-ovatis, emarginato-bidentatis, cæterum integerrimis, margine dorsali recurvo.

Hab. Among Musci: New Zealand. *Allan Cunningham.*

Stems very slender, about ¼ inch long, pale olive. Shoots compressed. Leaves in a series, rapidly increasing towards the summit of the shoot, the upper pair, sometimes, without any emargination. This is allied to P. *dendroides*, Nees, from Java, but the leaves are wider and shorter, the *sinus* more shallow and the cellules far more minute.

19. P. *connexa*, Hook. fil. et Tayl.; caule implexo, adscendente, incurvo, subramoso, apice incrassato, demum prolifero; foliis imbricatis, oppositis, verticalibus, adpressis, late orbiculatis, connatis, inferioribus integerrimis, superioribus subdenticulatis.

Hab. On roots of Ferns, New Zealand. *Allan Cunningham.*

Shoots scarcely one inch long, subcompressed, flexuose

or decurved, pale tawney. Inferior leaves very small, scarcely wider than the stem. *Perigonia* are terminal linear spikes, their leaves are smaller than the cauline and their tops recurved. Differs from P. *conjugata*, Lind., by the shorter shoots, and by the more closely imbricated and nearly entire leaves.

20. P. *Dicksoni*, Hook. fil. et Tayl.; caule elongato, laxe cæspitoso, vage ramoso, sub apice prolifero, ramis basi denudatis, complanotis; foliis approximatis, erecto-patentibus, rotundato-obovatis, apice dentatis, margine dorsali decurrentibus; calyce demum axillari, compresso, ex angusta basi obovato, ciliato.

HAB. Dusky Bay, *Mr. Menzies*. From *Mr. Dickson*, 1814.

Stems weak, with their repeatedly proliferous shoots 6-7 inches long, appearing here and there to be interruptedly leafy from the bases of the new shoots being nearly naked. Shoots of a pale tawney colour, usually solitary. This is allied to P. *laxa*, L. et L., which, however, has leaves more distant and more elliptical, and the interrupted appearance of the shoots arises from the occurrence of narrower *perigonia*.

21. P. *intertexta*, Hook. fil. et Tayl.; caule laxe cæspitoso, procumbente, vage ramoso; surculis compressis, subflexuosis; foliis laxe imbricatis, subhorizontalibus, patentibus, dimidiato-ovatis, apice rotundatis, dentato-ciliatis, margine ventrali cristato, dorsali recurvo; calyce obliquo, campanulato, compresso, ore ciliato.

HAB. Norfolk Island. *Allan Cunningham*.

Patches several inches wide, dusky olive-brown. Stems 2 inches long. Leaves when dry with both margins recurved, by which character the species may be known from P. *subplana*, Lind.; besides, the leaves are more imbricated, and are dentato-ciliate nearly all round their margin; the calyx too, is angulato-truncate.

22. P. *pachyloma*, Tayl.; caule laxe cæspitoso, surculis sub-

simplicibus, adscendentibus, subflexuosis; foliis imbricatis, patentibus, late dimidiato-ovatis, obtusis, margine ventrali ciliato, cristato, dorsali marginato, integerrimo, recurvo; calyce terminali, emerso, ovato, oblique truncato, ore spinoso.

HAB. Pichincha, picked out of specimens of P. *Pichinchensis*, *Prof. W. Jameson.*

Stems straggling, brownish-olive. Shoots 2-3 inches high. Leaves concave, sometimes secund, their *ciliæ* elongated and articulated. Perichætial leaves erect, shorter than the calyx, more round than the cauline. *Perigonia* are linear spikes in the course of the shoots, their leaves are destitute of *ciliæ*. The thickened margin and the *ciliæ* are somewhat browner than the rest of the leaf, and this margination does not occur in P. *longispina*, Gottsche et Lind. MSS.

23. P. *nodosa*, Tayl.; caule cæspitoso, adscendente, subramoso; foliis imbricatis, erecto-patentibus, subrotundis, margine utroque recurvo, infero apiceque dentatis; perigoniis iteratis, breviter spicatis.

HAB. North America. *Thomas Drummond, Herb. Hook.*

Tufts wide, olive-brown. Stems scarcely 1 inch long, their tops reclining. Leaves closely imbricated, the anterior margin slightly decurrent, much recurved and so the dorsal base of the leaf is tumid; the outline of the leaves is irregular, sometimes emarginate, sometimes with a *cilia* towards the base, but always with a deep groove towards the middle of the base. *Perigonia* 2, 3, or more in the course of a single shoot, which thus appears nodose; perigonial leaves ventricose, containing each a single anther, very rarely two, Anthers large, opaque, pedicellated. This reminds one of P. *bifaria*, Lind., but in this plant the leaves are more decurrent and are acuminated.

24. P. *fusifera*, Tayl.; laxe cæspitoso, erecto, ramoso, foliis imbricatis, erecto-patentibus, elongate semicordatis, obtusis, recurvis, margine infero apiceque dentatis, supero integerrimo, decurrente, utrinque recurvis; perigoniis plurimis, spicato-lanceolatis.

Hab. Niger Expedition. *Vogel, Hook. Herb.*

Patches little more than 1 inch high, dusky olive-green. Stems irregularly branched, almost all the branches bearing in their course, or at their summits, perigonial spikes. Leaves cristate on the inferior side of the stem. Bases of the perigonial leaves tumid, closely imbricated, their tops slightly twisted and squarroso-recurved. Allied to P. *concava*, Lind., but our plant is much larger, more branched, and has the leaves longer, more decurrent, and more distinctly denticulate.

25. P. *Colensoi*, Hook. fil. et Tayl.; caule laxe cæspitoso, adscendente, ramoso; foliis laxe imbricatis, erecto-patentibus, secundis, rotundato-ovatis, convexis, margine utroque recurvis, inferiori apiceque dentatis; calyce demum laterali, ex angusta basi oblongo, rotundato-truncato, dentato.

Hab. New Zealand. n. 159. *Colenso, Hook. Herb.*

Tufts loose, brownish-olive. Stems nearly 2 inches long, variously branched. Lower leaves smaller and nearly round, all of them minutely cellular. *Perigonia* are lanceolate spikes of 7-8 pairs of closely adpressed leaves; they occur in the course of the shoots. Perichætial leaves erect, adpressed to the calyx, and covering two-thirds of its length. Pedicels but little exserted. Capsule oblong. In our P. *aculeata* the leaves are very similar in outline but they are more patent, their dentation is coarser, their cellules far larger, while the calyx is much shorter and with stronger *ciliæ*.

26. P. *Bunburii*, Tayl.; caule cæspitoso, erecto, ramoso; foliis imbricatis subpatentibus, oblongo-ovatis, obtusissimis, apice subdenticulatis, marginibus sub-recurvis; calyce demum axillari, oblongo, bilabiato, labiis late linearibus, ciliatis, hinc partito, immerso.

Hab. Rio de Janeiro. *Mr. Bunbury, Hook. Herb.*

Patches wide, dusky yellowish-olive. Stems scarcely 2 inches high, irregularly branched, sometimes dichotomous. Leaves with the inferior margins gibbous and slightly cristate, their denticulation very minute, rarely wanting. Perichætial leaves erect, one-third longer than the calyx. One lip of the calyx is usually bilobate.

P. *pectinata*, Lind. is a much larger plant, has the leaves distant, and the calyx short and campanulate.

27. P. *confertifolia*, Tayl.; caule laxe cæspitoso, erecto, dichotome ramoso; ramis patentibus; foliis arcte imbricatis, erecto-patentibus, ovato-oblongis, obtusis, apice dentatis, margine utroque subrecurvis; calyce demum axillari, ex ovata basi ligulato, dentato, folia perichætialia erecta elongata superante.

HAB. South Brazil. *Sellow, Hook. Herb.*

Olive-brown. Stems 2 inches high. Leaves slightly decurrent, when dry having both margins recurved, when moistened nearly plane. This has an affinity to P. *Bunburii*, Tayl. and it is distinguished by its longer, more erect, and more deeply dentate leaves, which, too, are more narrow at their bases.

28. P. *Dominicensis*, Tayl.; caule laxe cæspitoso, elongato, erecto, ramoso, strictiusculo; foliis imbricatis, patentibus, majoribus, oblongis, apice obtusissimis, basi infera rotundatis, cristatis, margine infero apiceque longe ciliatis, margine supero subrecurvo; calyce demum laterali, obovato-campanulato, hinc fisso, ore ciliato.

HAB. Dominica, *Hook. Herb.*

Brownish-olive. Shoots 4-5 long, ¼ inch wide, complanate; branches few, irregular. Leaves scarcely decurrent, the perichætial conformable with the cauline. Pedicel exserted for about ½ the length of the calyx. Capsule ovate. This fine species is allied to our P. *Pichinchensis*, and to P. *superba*, Lind. differing from the former by the more crowded *ciliæ* of the leaves and shorter calyx, from the latter by the leaves not being falcate, and the calyx not alate; and from both by the obtuse leaves.

29. P. *macrifolia*, Tayl., caule cæspitoso, adscendente, ramoso; foliis laxe imbricatis, erecto-patentibus, secundis, concavis, linearibus, margine utroque revolutis, apice subtridentatis, cæterum integerrimis.

HAB. Peru, *Hook. Herb.*

Tufts wide, browish-olive. Stems about 2 inches long,

often uncinate. Leaves from a narrow base lineari-obovate, having two but scarcely ever more than three teeth at the summit, by which it is easily distinguished from P. *rutilan*, Lind.

30. P. *zygophylla*, Tayl.; caule laxe cæspitoso, adscendente, flexuoso, subsimplici, surculis interdum flagellaribus; foliis imbricatis, secundis, adpressis, planis, cuneato-rotundatis, margine supero basi connexis, integerrimis, infero spinoso-dentatis; calyce subexserto, terminali, obovato, hinc fisso, ore compresso, spinoso.

HAB. Ceylon. *Hook. Herb.*

Tawney olive. Stems 2-3 inches long. Lower leaves minute. Differs from *Jung. conjugata*, Hook. by the leaves being unconnected at their inferior bases; from *Jung. falcata*, Hook. by the fewer but stronger dentation of the leaves; and from both P. *opposita* and P. *biserialis*, Lind. by the shorter, wider, and scarcely exserted calyx.

3. SCAPANIA, *Lindberg.*

1. S. *breviflora*, Tayl.; surculis subcæspitosis, adscendentibus; foliis dentatis, profunde inæqualiter bilobis, lobis rotundato-triangularibus, ventrali convexo, patente, dorsali quadruplo minori, incumbente foliigero; perichætialibus conformibus, majoribus; calyce perichætio subæquali, ex angusta, squamis lanceolatis serratis circumdata basi obconicis, plicatis, compressis, breviter 4-laciniatis, dentatis.

HAB. Near Philadelphia. *Dr. Watson.*

1-2 inches long, growing among *Musci*, loosely cæspitose, dusky olive, the younger shoots pale green; branched with 2-3 annotinous shoots from the same point below the calyx. The upper lobe is fixed on the lower as in *Gottschea*, a character most remarkable in the perichætial leaves. Calyx short. This species may be distinguished from S. *uliginosa*, Nees, by the dentate leaves, which, too, are subacute, by their minuter cells, and by the calyx being scarcely exserted out of the perichætium.

2. S. *brevicaulis*, Tayl.; caule abbreviato, cæspitoso, subramoso, adscendente; foliis imbricatis, patentibus, integerrimis, inæqualiter bilobis, oblongo-ovatis, obtuse apiculatis, dorsali triplo minori; calyce obovato, gibbo, subcompresso, apice plicato, hinc fisso, ore integerrimo.

HAB. North America. *J. Drummond. Hook. Herb.*

Patches wide, brownish-olive. Stems about ¼ inch long, with radicles at the base, ascending and incrassated at the top. Upper leaves closely imbricated, all usually with a short obtuse point, yet sometimes they are rounded and even slightly emarginated; perichætial leaves similar to the cauline but more patent. Calyx scarcely truncated, the upper margin shorter and more plicate. This differs from S. *irrigua*, Nees, by the shorter stems, the entire leaves, and the wider and entire plicated mouth of the calyx.

4. JUNGERMANNIA, *Linn.* (char. emend. Nees.)

1. J. *leucocephala*, Tayl.; caule subcæspitoso, erecto, subramoso, ramis erectis, subbinis; foliis secundis, imbricatis, late ovatis, concavis, bifidis, segmentis inæqualibus, acutis, apiculatis, margine ventrali, amplexante, basi uniciliato; calyce terminali, cylindraceo, 4-angulato, acuminato, ore incano, subdenticulato.

HAB. On trees, on Cayambe, at an altitude of 14,000 ft. 1827, *Prof. W. Jameson. Dr. Greville's Herbarium.*

Stems 1-2 inches high, brownish purple. Leaves tumid, entire, divided half way to the base by an acute *sinus*. Perichætial leaves erect, adpressed, their segments elongated, with hoary points. This species differs from J. *piligera*, Nees, by the shorter, more concave leaves, whose segments are not complicate, by the single, very considerable *cilia* at the base near the stem of the ventral segment, and by the acuminate calyces.

2. J. *leucostoma*, Tayl.; caule cæspitoso, adscendente, ramoso; foliis laxe imbricatis, arcuato-patentibus, secundis, quadrato-ovatis, concavis, bifidis, segmentis ovatis, acutis,

incurvis, ventrali minori, basi uniciliato; calyce terminali, subrotundo, sursum plicato, ore albido, denticulato.

HAB. Peru. *Prof. W. Jameson.*

Tufts loose, brownish-purple. Shoots 1 inch long, the fertile incrassated above. Perichætial leaves two or three, wider than the cauline, erect, their inner margin undulate. Calyx nearly round, obtuse. Very like the preceding; but its stems, leaves, and calyces are much shorter and wider.

3. J. *anacampta*, Tayl.; caule cæspitoso, adscendente, subramoso; foliis imbricatis, subsecundis, obovatis, ex basi amplexante reflexis, canaliculatis, bilobis, segmentis æqualibus, ovatis, obtusiusculis, ventrali basi uniciliato; calyce demum laterali, cylindraceo, inflato, obtuso, sursum subplicato, ore minute dentato.

HAB. On bark, North America. *J. Drummond, Hook. Herb.*

Patches wide, tawney-brown. Stems nearly 1 inch long, sparingly branched, squarrose with recurved leaves. Calyx naked below, the base narrower than the inflated summit. Differs from J. *incumbens*, Lind. et Lehm., by the greater size, the more obtuse lobes of the leaves, and by the obovato-cylindraceous calyces.

4. J. *supina*, Tayl.; caule implexo, prostrato, subsimplici, sursum incrassato; foliis laxis patentibus, inæqualiter bifidis, segmento ventrali majori, ovato, dorsali lançeolato, utroque apiculato, integerrimo; foliis perichætialibus latioribus, trifidis, apiculatis, dentatisque; calyce terminali, obovato, inflato, oris segmentis apiculato-dentatis.

HAB. On rotten wood, North America. *J. Drummond, Hook. Herb.*

Stems scarcely 3 lines long, radicating. Leaves of the infertile shoots more distant, more narrow, and more unequally divided; in the fertile the pair below the *perichætium* are trifid and entire, while the perichætial are not only trifid but also dentate. Calyx short, obovate, rather large for the size of the plant. *Perigonia* terminal, their leaves with tumid bases, each containing one or two pedicellated anthers. Resembles some states of J. *bicuspidata*, L., but there the fruit

is not on proper stems; the calyx is more nearly rotundate, and the leaves more unequally divided, while their segments are apiculate.

5. J. *scitula*, Tayl.; caule implexo, prostrato, subsimplici; foliis subverticalibus, imbricatis, erecto-patentibus, concavis, rotundato-obovatis, apice trifidis, segmente ventrali majori, integerrimis; gemmis foliorum segmenta terminantibus, minutissimis, rubris.

HAB. North America. *J. Drummond, Hook. Herb.*

Patches wide, but shallow, tawney-olive. Stems bound down by numerous rootlets, slightly ascending at their summits. Leaves pale, the notches shallow, the segments ovate, acute, the two dorsal the smaller. No stipules. The leaves are more vertical, less decurrent, and have a narrower base than in J. *barbata*, Schreb.; besides, their emargination into three pieces is more limited to their summits, and the cellules are much minuter.

6. J. *Tasmanica*, Hook. fil. et Tayl.; caule laxius cæspitoso sparsove, procumbente, demum subramoso; foliis imbricatis, secundis, erecto-patentibus, ex lata basi oblongis, apice rotundatis, margine subrecurvis, integerrimis; retis maculis majoribus.

HAB. With *Scapania Urvilleana*, Mont. n. 53. Van Diemen's Land. *Gunn*, 1844. *Hook. Herb.*

Stems mostly scattered, sometimes aggregated, about 1 inch long, reddish-brown, the younger parts whitish-green. Leaves closely imbricated, secund on the dorsal edge of the stems, rarely with a shallow notch. In one instance, only a single oblong and entire stipule was observed about the middle of the stem. The present is closely allied to J. *Orcadensis*, Hook. but the leaves are longer, have commonly a rounded and entire summit, their margins are less recurved, while their cells are far larger and more distinct.

7. J. *elongella*, Tayl.; caule laxe cæspitoso, adscendente, subsimplici; foliis subapproximatis, erectiusculis, secundis, oblongis, latis, obtusissimis retusisve, integerrimis, submarginatis, perichætialibus duobus interioribus minoribus,

laciniato-spinosis; calyce terminali ex angusta basi elongato-obconico, tumido, sursum subplicato, ore lacero-dentato.

HAB. Nepal. *Wallich.*

Patches loose, their tops reddish. Stems more than 1 inch long, with one or two innovations from the summits, their tops incurved. Roots descend from the entire inferior side of the stems. Leaves with a series of larger cells all round the margin. *Perigonia* are short spikes, sometimes terminal, sometimes in the course of the shoots, their leaves have elongated tumid bases, and in general a short, rather obtuse process on the dorsal margin. Calyx elongated. This differs from J. *Tasmanica*, just described, by its smaller size, and by the remoter leaves, whose margins are plane, never recurved.

8. J. *revolvens*, Hook. fil. et Tayl.; caule cæspitoso adscendente, ramoso; foliis imbricatis, patentibus, oblongis, margine utroque recurvo, integerrimo; calyce terminali, oblongo, tumido, obtuso, subincurvo, sursum obtuse quadriplicato, ore minuto, denticulato; foliis perichætialibus binis, digitato-laciniatis, calyci adpressis.

HAB. Van Diemen's Land. *Gunn. Hook. Herb.*

Patches wide, pale olive-green. Stems about 1 inch long, irregularly branched, creeping, the new shoots adscending. Both margins of the leaves recurved, as in several *Plagiochilæ*; the cellules large at the junction of the leaves to the stems. No stipules, except a few, almost inconspicuous towards the tops of male shoots. Calyx curved, as in J. *lanceolata*, L. The perichætial leaves or scales are concealed by the adjoining pair of cauline leaves, they are anomalous, being deeply laciniated; by which character and by the recurvation of both margins of the leaves, our present plant differs abundantly from J. *lanceolata*, L.

9. J. *pansa*, Tayl.; caule disperso, brevissimo, basi reclinato, radicante, apice adscendente, incrassato; foliis imbricatis, secundis, rotundatis, integerrimis, margine recurvis.

HAB. On clay, Swan River. *Mr. James Drummond.*

Stems scarcely two lines long, brownish-olive, in a dry state appearing channelled from the recurved margins of the leaves. Lower leaves very small, those of the summit ten times larger; their texture is dense, somewhat carnose. No fruit present; hence it may be of a different genus. It grew intermixed with *Petalophyllum Preissii*, Gottsche.

10. J. *placophylla*, Tayl.; caule laxe cæspitoso, erecto, elongato, subramoso; foliis distantibus, erecto-patentibus, tenuissimis, scariosis, oblongis, obtusissimis, complanatis, margine subundulato, integerrimo; stipulis majoribus, cordato-obovatis, integerrimis.

HAB. East declivity of the Cordilleras of Peru. *Prof. W. Jameson.*

Shoots 2-3 inches long, olive brown, flat. Leaves and stipules distant, their outline irregularly indented, their tops either rounded or sometimes retuse, quite entire. This has the habit of J. *palustris*, Hook. fil. et T., from Cape Horn; but the leaves are more distant, quite flat, and neither round nor so plicate.

11. J. *paupercula*, Tayl.; caule sparso, tenuissimo, repente, subramoso; ramis elongatis, simplicibus; foliis distantioribus, minutis, oppositis, erectis, semicordatis, concavis, integerrimis; stipulis bipartitis, segmentis filiformibus, articulatis, utrinque exterius basi unispinosis.

HAB. Creeping on *Sendtnera pruinosa*, Tayl. MSS. in woods of Pichincha, near Quito, 1845. *Prof. W. Jameson.*

Stems finer than human hair, blackish, shining when dry; shoots simple, sometimes three inches long, to the naked eye resembling a fine thread with minute knots at regular intervals. Leaves slightly decurrent, the dorsal margin incurved. Stipules unconnected with the leaves. Close to the stipules arises a lanceolate cluster of rootlets by which the plant attaches itself for support. No fruit observed. This reminds one of *Plagiochila Brauniana*, Lind., but the stems are finer and longer, while the presence of stipules is at once distinctive.

12. J. *squarrosula*, Tayl.; caule brevissimo, cæspitoso, adscendente, subsimplici; foliis stipulisque laxis, subpatentibus, oblongis, bifidis, segmentis ovatis, acutis, margine reflexis, subdentatis.

Hab. No. 54. On charcoal. Swan River; *Mr. James Drummond.*

Tufts wide, forming low olive green cushions. Stems scarcely exceeding a line in length. Leaves amplexicaul, concave, their tops recurved, their *sinus* acute. This species is far more minute and erect than Jung. *Francisci*, Hook., and the leaves are distantly denticulate, and have a deeper *sinus*. In the dry state it has a squarrose habit.

13. J. *asperifolia*, Tayl.; caule sparso, exili, adscendente, vage ramoso; foliis laxis, basi patentibus, apice erectis, concavis, subquadratis, bifidis, segmentis acutis, margine dorsoque celluloso-dentatis; stipulis minutis, ovato-acuminatis, dentatis; calyce terminali, oblongo, subcompresso, subplicato, ore subintegro.

Hab. On *Dicranum clavatum*, Schw. No. 10. Madeira; *Dickson.*

Excessively minute, purplish-brown, ascending, scattered or in very loose patches. Stems very slender; branches short. Leaves bent forwards at an angle. Stipules rarely bifid, ciliato-dentate. *Perigonia* large, ventricose, forming an obtuse spike. The two lateral perichætial leaves subtrifid, ciliate, segments acuminate, the ventral oblong, sometimes emarginate, seldom bifid. Calyces purplish below, the colour discharged from their tops. The margins and backs of the leaves are celluloso-echinate as in *Lejeunia calcarea*, Libert. In size and habit it resembles *Jung. byssacea*, Roth, differing essentially by the concave celluloso-dentate leaves.

14. J. *glaucocephala*, Tayl.; caule cæspitoso, exiguo, erecto, subramoso; foliis laxis, ex angusta amplexante basi oblongis, inæqualiter bifidis, segmente dorsali erecto, minori, ventrali reclinato, utroque obtusiusculo, sinu obtuso.

Hab. On rotten wood, North America. *J. Drummond, Hook. Herb.*

Tufts scarcely exceeding a line in height, the older and inferior parts olive brown, the younger and upper glaucous green. Shoots crowded, erect, parallel. Easily distinguished from *Jung. bicuspidata*, L. by the more tufted growth, the erect shoots, and by the erect sheathing bases of the leaves, whose structure is more minutely cellular.

15. J. *reclusa*, Tayl.; caule repente, implexo, subpinnato; foliis secundis, approximatis, semiverticalibus, rotundato-quadratis, bifidis, perichætialibus majoribus, erectis; calyce ramulum proprium terminante, cylindraceo-ovato, acuminato, subtrigono, ore denticulato; capsula ovata.

Jung. reclusa, Tayl. Annals and Magazine of Nat. Hist. Aug. 1843, p. 88. J. *bicuspidata*, α. γ, *ericetorum*, Syn. Hepat. p. 140.

Hab. On mural clay banks; south of Ireland; very common.

Tufts shallow, superficial, of great extent, olive brown, with scattered whitish calyces rising above their level. Stems filiform. Leaves minute, not exceeding in size those of *Jung. byssacea*, Roth. No stipules. The eminent editors of the "*Synopsis Hepaticarum*" consider this species merely a variety of J. *bicuspidata*, L. It differs by the smaller size, by the shorter leaves, which are more opaque and more concave, with a *sinus* which is shallower and more rounded, the leaves too, are more crowded, are secund, are rotundato-ovate, their cells are more minute, while they are separated from each other by larger vessels; the *perichætium* is shorter and its leaves less acuminated; the colour of the plant is darker, when fresh of an olive green; the growth is more tufted; the *gemmæ* are smooth, never angular, and are situated on a cluster of leaves, and never on a naked *capitulus*. But the shape of the capsule is very decisive; in both it is an ellipsoid; but in J. *bicuspidata*, L., the transverse diameter is to the conjugate as 12 to 5, while the ratio in J. *reclusa*, is as 8 to 5.

16. J. *extensa*, Tayl.; caule implexo, procumbente, ramoso; foliis imbricatis secundis, concavis, grosse cellulosis, oblongis, bifidis, segmentis acutis, perichætialibus trifariis, oblongo-lanceolatis, segmentis obtuse dentatis; calyce lineari-lanceolato, ore plicato, denticulato.

HAB. On bark; Observatory Inlet; North America. *Dr. Scouler.*

Patches extensive, flat, whitish-green. Stems about ¼ inch long. Stipules none. Shoots radicating, their summits ascending. *Perichætia* are short lateral shoots; their leaves sometimes trifid, their segments obtusely dentate. Pedicells short. Capsule linear-oblong. Differs from J. *bicuspidata*, L., by the smaller size, the imbricated and secund leaves, the dentate perichætial leaves, and by the narrower calyx whose cells are smaller.

17. J. *exiliflora*, Tayl.; caule exiguo, subcæspitoso, surculis adscendentibus, subramosis; foliis confertis, cordatis, bifidis, segmentis inæqualibus, stipulis minutis bifidis; calyce terminali, obovato, 4-plicato, truncato, subcompresso, laciniis integerrimis.

Jung. *divaricata*, ε. *exiliflora*, Syn. Hepat. p. 136.

HAB. On charcoal; Swan River; *Mr. James Drummond.*

Tufts superficial. Fertile stems reddish-purple, the barren more loose and reddish-green. Leaves crowded even at the base of the shoots, larger towards the tops of the stems, their margin flexuose, the greater segment frequently shews a single tooth on one side of the base. Stipules very minute, oblong, usually unequally bifid, sometimes nearly entire. The three perichætial leaves are connate at the base. *Perigonia* terminal, often, however, in the course of the shoots. Calyx obovate. Capsule oblong-ovate. Elateres filiform, flexuose. Seeds round, reddish. This species strongly resembles J. *byssacea*, Roth, and differs by the crowded, cordate leaves, by the obovate calyx, whose *laciniæ* are entire, and by the presence of stipules.

18. J. *unguiculata*, Hook. fil. et Tayl.; caule sparso, sim-

plici, abbreviato, incrassato, repente, apice adscendente; foliis arcte imbricatis, concavis, sursum secundis, rotundatis, apicalibus spinosis, incurvis; stipulis oblongis, spinosis.

HAB. Near sulphur springs, New Zealand. On tufts of *Musci*; n. 258. 1844. *Hook. Herb.*

Stems about ⅛ inch long, tumid, pale olive-green. Leaves with their spinous teeth incurved as the talons of a bird; the upper more erect and oblong. Stipules observable only near the summits of the stems. The male shoots are smaller; between the terminating pair of their leaves are numerous, crowded, pedicellated, whitish anthers, a distribution that would indicate a peculiar *genus*. This species has the habit of *Gymnanthe Wilsoni*, Tayl. The stems, however, are shorter, the leaves more crowded and never bifid. A small specimen only was seen.

19. J. *colpodes*, Tayl.; caule dense cæspitoso, erecto, subramoso; foliis imbricatis, erecto-patentibus, secundis, orbiculatis, bifidis sinu angusto ejusque margine recurvo; lobis subæqualibus, rotundatis; perichætialibus quadrifidis, basi utrinque unidentatis; stipulis bipartitis integrisve lanceolatis, basi utrinque subunidentatis; calyce terminali, ex angusta terete basi lineari-obovato, subcompresso, sursum subplicato, ore laciniato, denticulato.

HAB. North America, *J. Drummond*, *Hook. Herb.*

Tufts wide, dark olive-brown, two inches high. Stems prolonged by one or two annual shoots. Leaves rather concave. The inner pair of perichætial leaves somewhat smaller than the cauline. Pedicel about ½ inch long. Capsule shortly oval. Our plant differs from *Jung. plicata*, Hartm., (if we understood the characters given), by the erect stem, by the equal lobes of the leaves, and by the calyx being by no means split down on one side.

20. J. *longiscypha*, Tayl.; caule implexo, ramoso, surculis adscendentibus; foliis laxis, trifariis, subincurvis, bipartitis, segmentis setaceis, articulatis, perichætialibus oblongis

bifidis, segmentis dentatis; calyce in ramulo proprio, brevi, terminali, lineari-subulato, subincurvo, apice subtrifido, integerrimo.

HAB. Swan River. On sand. *Mr. James Drummond, Hook. Herb.*

Patches wide, pale olive-green. Shoots about two lines long. Calyx usually exceeding the adjoining shoot in length, very narrowly cylindrical, acuminate, its lips entire, although in a young state the mouth is kept closed by excessively minute dentiform processes on the tips of the segments. This is allied to J. *setacea*, L., and J. *tricophylla*, L., but the calyx is longer, more slender and the segments of its mouth are entire, while the perichætial leaves are not so deeply divided.

4. SPHAGNŒCETIS, *Nees.*

1. S. *longiflora*, Tayl.; caule disperso, prostrato, subsimplici, flagellifero, foliis imbricatis, patentibus, obovato-rotundatis, immarginatis, integerrimis, subconcavis; calyce elongato-subulato, subplicato, incurvo, ore minuto denticulato.

HAB. One or two bits occurred on *Plagiochila macrostachya*, Lind. from Jamaica.

Pale green. Stems scarcely 1 inch long, rather thick. Leaves gibbous on the ventral margin, slightly inflexed on the dorsal; their cells large at the base and centre, but diminishing towards the margin. *Perichætia* short, the leaves few, amplexicaul, ovato-lanceolate. Calyx and *perichætium* form one curve: the former equals six or eight leaves in length and is somewhat plicate. Capsule cylindrical. Flagelliform shoots flattish, elongated, having fibrous roots at their extremities. This differs from S. *communis*, Nees, by the more elongated calyx, and from it as well as from S. *prostrata*, Nees, by the want of margination to the leaves; while the round leaves would appear to separate it completely from S. *radicosa*, Nees.

Under a good microscope and to practised powers of

observation it is reasonable to expect that the cellular structure of the leaves would appear different in distinct species of *Hepaticæ*. Thus the microscopic phenomena are so different in S. *communis*, Nees, and in *Jung. denudata*, Nees, that we may safely conclude them to be distinct, without taking into account the drier locality, darker colour, upright stems and presence of stipules in the latter.

5. Pleuranthe, *Taylor*.

Calyx basi radicans, solidus, incurvus, folia tria perichætialia ferens, e caulis ventre oriens, medio carnosus, teres, cylindricus, *apice* membranaceus, conicus, subcompressus, ore subplicato, bi-tri-lacero-laciniato. *Calyptra* calycis fauci insidens. *Elateres* bispiri. *Capsula* subquadrivalvis.

1. P. *olivacea*, Tayl.

Hab. North America. *J. Drummond, Hook. Herb.*

Caules implexi, flexuosi, reclinati, radicantes, semiunciales, subsimplices, pallide olivacei. Folia sursum secunda, imbricata, erecto-patentia, recurva, unde surculi canaliculati, rotundato-oblonga, sinu brevi emarginata. Stipulæ lanceolatæ, integerrimæ. Calycis basis solida receptaculi vice fungitur, ejus folia tria caulinis multo minora sunt atque erecta; pars autem media, ante pedicelli elongationem, capsulam mactam tenet. Pedicellus vix semiuncialis. Capsula late ovalis. Flores masculi ignoti. Fructus junior primum in stipulæ axilla apparet, minutus, globularis, albidus. Desunt radices flagelliformes.

6. Chiloscyphus, *Nees*.

1. C. *cubans*, Tayl.; caule laxe implexo, procumbente, subramoso; foliis alternis, contiguis, patentibus, oblongis, apice rotundatis, subquadridenticulatis; stipulis minutis, rotundato-quadratis, bifidis basi extus bispinosis.

Hab. Nepal, *Wallich*.

Brownish. Stems 1 inch long. Shoots complanate. Leaves horizontal. Stipules scarcely wider than the stems.—This approaches to C. *Endlicherianus*, Nees; it is distinct by the

more ovate leaves, by the indentations between the teeth of the leaves and by the more compound stipules.

2. C. *jugalifolius*, Tayl.; caule laxe implexo, procumbente, subsimplici; foliis subimbricatis, patentibus, ex lata basi triangulari-ovatis, retusis, biciliatis, cæterum integerrimis, cum stipulis minoribus 4-5-ciliato-partitis connatis.

HAB. Guyana. *Richard, Hook. Herb.*

Dusky olive-green. Stems above an inch long, one tenth of an inch wide, rather straight. Stipules scarcely wider than the stems; their *ciliæ* elongated, articulated. This differs from J. *coalita*, Hook. by the longer and more patent leaves, by the more inconsiderable stipules, which are more deeply divided.

3. C. *gibbosus*, Tayl.; caule implexo, procumbente, ramis erectiusculis, incrassatis; foliis imbricatis, patentibus, concavis, oblongis, acutiusculis, integerrimis, apice recurvis, stipulæ quadrato-rotundatæ, emarginato-bifidæ, hic illic spinoso-dentatæ conjunctis; calyce terminali, ovato-acuminato, inflato, gibbo.

HAB. Martinique; *Richard, Hook. Herb.*

Purplish brown. Stems 2-3 inches long, shoots flattened. Stipules large, joined by a very narrow isthmus on each side to the leaves. Calyces larger, subtrigonal, pale, the mouth small, subdentate. The leaves are far longer and more closely imbricated and the stipules longer than in C. *grandifolius*, Tayl.

4. C. *Drummondii*, Tayl.; caule implexo, repente, subramoso, gemmifero, adscendente, attenuato; foliis erecto-patentibus, oblongis, bifidis, cæterum integerrimis, stipulæ ovatæ, acutæ, subintegerrimæ utrinque connatis; calyce sessili, ventrali, basi laciniato-squamoso, oblongo, inflato, ore bifido, acuto, subcompresso.

HAB. On trees; North America. *J. Drummond, Hook. Herb.*

Patches dense, pale yellowish-green, the gemmiferous part brown. *Gemmæ* in minute *capitula* on ascending stems whose leaves diminish towards the top. Leaves nearly patent,

slightly recurved. Calyces on very short naked stalks, at the base somewhat bulging down. Its minute size, bifid leaves, and nearly entire stipules are very distinctive.

5. C. *labiatus*, Tayl.; caule implexo, prostrato, subsimplici; foliis imbricatis, erecto-patentibus, oblongis, subemarginatis, cæterum integerrimis; stipulis minutis, discretis, quadripartitis, segmentis setaceis, duobus mediis longioribus; calyce ventrali, ex angusta basi obovato, sursum compresso, plicato, bilabiato, labiis reflexis, spinoso-dentatis.

HAB. Near Columbus, Ohio, U. S. No. 105; *W. S. Sullivant*, 1843. *Hook. Herb.*

In loose whitish-green patches. Stems ½ inch long; shoots, flat. Leaves loosely imbricated, their tops recurved. Stipules not wider than the stems. The two lips of the calyx compressed and together curving down. The lateral perichætial leaves each with one or two spinous teeth on the anterior margin, the stipular bifid, sometimes quadrifid. The inner perichætial leaves the smaller.

6. C. *supinus*, Hook. fil. et Tayl.; caule supino, implexo, subramoso; foliis laxe imbricatis, patentibus, oblongis, subbidentatis, margine ventrali gibboso, recurvo; stipulis 6-8 laciniatis, segmentis subulatis; calyce hypophyllo, laterali, campanulato, ore flexuoso-laciniato.

HAB. Bay of Islands; New Zealand. *Dr. Sinclair, Herb. Hook.*

Patches wide; younger parts pale yellowish-olive, the older dusky brown. Leaves sometimes entire, sometimes trifid, but commonly bidentate, the *sinus* obtuse. Segments of the stipules sometimes dentate. Perichætial leaves nearly as long as the calyx, one of them larger, 3-4-fid, the lesser bifid, the stipular the shortest. Related to our C. *biciliatus*, likewise from New Zealand, but is smaller, with the tops of the leaves less rounded, their *sinus* deeper, and the stipules more laciniated.

(*To be continued.*)

BOTANICAL INFORMATION.

Notes on the Vegetation *and general character of the* Missouri *and* Oregon Territories, *made during a Botanical Journey in the State of Missouri, and across the South Pass of the* Rocky Mountains, *to the Pacific, during the years* 1843 *and* 1844 ; *by* Charles A. Geyer.

(*Continued from p.* 208, *Vol. V.*)

Mountain region.—Along the grassy slope of this valley grow a great number of plants of my collection. *Lathyrus* 624 is the most showy of the few *Leguminosæ* here, and of very rank growth. No *Lupinus* grows in this cool loamy soil. The most abundant is the *Hosackia Purshiana,* which fronts the inundated meadow valley, on rocky ground, joining the narrow Indian trail, on the other side of which runs a meadow a mile-long bordered by *Clintonia elegans,* rivalling the bright azure above, (July.) With the diffuse dense *Hosackia* groups grow erect the *Crucifera* 234, in fine contrast with the deep blue flowers of *Gamassia esculenta,* appearing under the shade of some poplars, and with the aforesaid *Clintonia.* Here also I gathered the *Graminea* 320, which is very rare. On slight elevations grows the clustered *Trillium* 291, a curious species; sometimes there are a dozen or more from one joint of the rhizoma, all their stems in the ground. Here again grow profusely *Fritillariæ* 315 and 599, with *Erythronium* 601, lasting three weeks or longer in bloom, which is a rare occurrence in the flora of this region. Another somewhat rocky elevation, harboured three other rare little plants, the *Biscutella* 607, *Apargia* 292, and *Cynoglossum* 290, every where surrounded with masses of the white *Dodecatheon, Saxifragæ* 619 and 625, among which is seen now and then a bush of *Espeletia helianthoides* and *Batschia Torreyi?* (605).

By ascending the wooded terraced slopes of the moun-

tains, and following the course of a rivulet from the low meadow we step into one of the poplar groves, already mentioned; the dry parts of which bear shrubs of *Acer* 616, a small shrub-like tree with several stems from one base, or rarely simple, never averaging more than 15—20 feet high, and 4—5 inches diameter of trunk in that region. Under its shade grow *Pyrola secunda* and 427, and *Linnæa borealis* with *Viola* 602, *Asarum* 598, and *Claytonia* 321. In the muddy bed of the rivulet is seen the *Arum* 327 with its pale-sulphur-yellow spathas. Later in the season (August) appear its large ovate-lanceolate leaves from 12 to 18 inches long, resembling a full grown tobacco leaf, then the berries begin to ripen, taking a scarlet colour, as in many species of this genus.* Higher up, where the rivulet runs in rocks, the banks are dressed with *Smilacinæ*, as *Streptopus* 524 and 611; *Smilacina* 325, also with *Thalictrum* 622, and *Tiarella* 623, *Luzula* 318 and *Circæa alpina*.

Right and left we now find spacious, open, grassy woods, ornamented with the largest specimens of *Pinus ponderosa*, up to 180 feet high, and 8—10 feet diameter of trunk, so full of resin that they will burn in a moment from the foot to the top, if fire is set to them on a dry day. These localities are elegant natural parks; they bear a resemblance the more as they are crossed in every direction by narrow foot-paths, leading to the lodges of the Indians, hidden behind the large pine-trunks. Between grow thickets, each composed of a few shrubs of *Cratægus lucida*, *Spiræa ariæfolia*, *Cerasus* 288 and 496; or *Rhamnus* 522 and *Acer*, over which twines gracefully the two *Clematides* 615 and 617, the former blooming early in May, resembling the *C. gran-*

* This takes place towards the latter part of summer, when the brown and black Bear feasts on the many berries which this region affords. Then he also visits these shady cool recesses to partake of those of the *Arum* which he manages with great care; eating (according to the information derived from hunters and the Indians) every time, but little, and returns as many days as these berries last, using the same probably as a digestive. They have a very acrid and pungent taste.

diflora; the latter, late in August. A tall species of *Aconitum*, too, blooms 6—7 feet high among these thickets. The grasses, as every where on the west side of the Rocky mountains, consist chiefly of the two species, *Triticum* 192, and *Festuca* 356; both are called "bunch-grass"* by Anglo-

* It is erroneous to believe that these two species of grasses grow naturally so in separate tufts or bunches. The cause is a mechanical one, mainly owing to the annual fires, the great heat and drought during the latter part of summer, as well as to the deep snows, the wet in the month of March accompanied by severe bare-frosts. But the same causes again may also occasion part of that excellence, which these grasses possess in respect to feeding qualities, which surpass the best grain fodder. Yet, I am sure that great part is likewise owing to the kinds; for, in the lower regions, on the Upper Missouri River, where there is an elevation of only about 1000 feet, without these extremes of heat, and the destruction by fire, the *Triticum Missuricum* enjoys the same reputation as excellent fodder for horses and cattle. Two weeks are sufficient to fatten a poor horse, when the first blades spring out in March. There it grows not in bunches, but in dense carpets, suffering scarcely any other plant amongst itself, save a few *Opuntia* groups. Yet the *Festuca* 356, surpasses the *Triticum* by far, which grass I never recognized east of the Rocky Mountains. Horses and cattle, therefore, in Upper Oregon feed on the former, only in the absence of the latter, which occurs in such places where water remains long in the spring. The extreme heat in Oregon give to these grasses another great value, on which the importance of Upper Oregon, as a grazing country, depends. The heat commences about the 1st of July, when the parching rays of the sun, suddenly dry up the blades of the grass, and render it a wholesome hay. The centre of the tufts, however, remain green, waiting only for a little moisture to renew the growth, which also takes place about the middle of September, during a series of wet, foggy, cloudy days. Soon afterwards, frosts arrest its growing a second time, and a deep (2-3 feet) snow covers it for five months. I have convinced myself that these grasses, thus checked and excited, keep green and grow a little, even under the snow. The frosts and snow render the dry blades brittle, and the horses and cattle eat it with greediness, mixed with the young green parts which they find in the centre of the tufts; digging for it with their feet day and night, remaining fat through the winter; and poor ones will, if healthy, get fat notwithstanding that labour. This is the case in places where the fires do not reach; but when fires follow after the heat and drought, it will soon grow again and keep green under the deep snow. The soil is generally a heavy loam, mixed with fragments of granitic and basaltic rocks; getting very hard

American travellers. In these meadows, figures conspicuously the large-flowered *Phlox* 375; a suffrutex of about 1½ foot high, forming a globular mass of bright rose-coloured flowers, accompanied by *Delphiniam* 600, *Compositæ* 309 and 297, *Myrrhis?* 610; together again with the above *Fritillariæ*, *Erythronium*, *Saxifragæ*, *Ferula* 314 and others, which fill every space, and one beholds with wonder the multitude of flowers called forth by two or three sunny weeks of April or May. A strawberry gathered here also (612) attracted my attention, as most specimens exhibited an appendicule on the petiole. In fruit also it seems to differ from those on the east side, which has, by cutting it lengthwise, a cordate outline; the seeds of the few berries I met with, were more superficial and fruit larger, of a deep red colour. I found it again on the foot of the snowy ridges on the high plains of the Saptonas, where it had the same characters.

Arriving at the basaltic wall of the mountain, we meet again with *Mahonia aquifolia*, *Pentstemon* and *Peucedanum* mentioned before. The rock above is adorned with *Heuchera* 388 and *Sedum stenopetalum*, sometimes a shrub of *Amelanchier Canadensis*, *β*, *ovalifolium*, or a cherry shrub grows out

about the time when the seeds are ripe; hence they will burn up, as well as the borders of the tufts and their dry centres, separating one tuft into several. Seedlings which escape the fire, must either lodge in the tuft, or they will be destroyed by rot under the deep snow, or the wet and bare frosts in the beginning of spring. Sir Wm. Stuart, who, during his travels, became acquainted with these grasses, has raised already a great many from seeds, which he gathered himself many years ago. Even there (Scotland) they preserve a great deal of their primitive character, and will, no doubt, surpass expectations. Here I must remark, that I somewhat doubt the identity of the *Triticum* on the Missouri and that of Oregon. The former is the same Sir Wm. Stuart cultivates, the same which agrees perfectly with the description of *Triticum Missuricum*, Sprengel, (See Spr. Syst. Veget. Appx.). Drs. Torrey and Gray recognized it as *T. caninum*, and Prince Neuwied calls it a variety of *Triticum repens* In my estimation it differs from the latter even in its creeping, but short, thick, and ramose root.

of the crests. Above we step again on a grassy but sloping terrace ornamented with *Espeletia helianthoides*, the large-flowered *Phlox*, *Geranium* 402, *Gymnandra* 230, *Ferula* 411 and *Helianthus* 34. At a distance we behold again pine-openings, including meadows, elevated and dry. No great variety of flowers marks these warm protected spots, but by closer examination, we find here the pretty *Liliacea*, *Calochortus* 299, very abundantly huddled in the thick grassy tufts, sending up its solitary erect leaf. *Orobus* 312 grows likewise here. From hence we direct our steps to a dense young thicket of spruce, clothing a steep slope of the upper part of the mountain, so dense that a bear would make a circuit to avoid passing through it. Difficult as the passage is, in the listless dark seclusion we find the elegant *Calypso*, and at the same time with it *Linnæa borealis*; here also did I find *Goodyera* 595, *Epigæa repens*, *Chimaphila corymbosa*, *Anemone* 606, and *Arctostaphylos uva ursi*.* These young thickets spring out of the remains of one of the forests of gigantic *Pinus ponderosa*, which was destroyed by fire, and consist of two or three species *Abies*, *rubra? nigra* and *balsamea*, the latter is seen only in moist places. On the somewhat level top of the mountain grow again large pines, encircled with *Populus betulæfolia*, *Acer*, *Spiræa ariæfolia* and *Cratægus*. With the last named I found *Ribes* 293 growing, a shrub 8—10 feet high, with handsome white conspicuous flowers, in deflexed racemes. As I did not see it in another place I returned to this spot to get seed, but was disappointed. The Indians told me that it bore a reddish-brown berry.

A view over this region from the top of one of these high mountains is truly sublime. The Cœur d'Aleine River, a placid deep stream, fringed with Poplar, *Salix* 636, 286 and 287, *Cratægus* and *Cornus*, divides the fertile valley, in its

* *A. uva ursi*, Spr. fills the surface of about one third of the woods of Upper and Lower Oregon. This is the famous tobacco ingredient, which the Indians use, mixing the same with one and a half of tobacco, which they get from the fur traders. For this purpose they select such as has grown.

serpentine course, into many indentations, which contain on each side a series of lakes, reflecting the towering Green mountains, whose bases they often reach, and harbour immense numbers of water-fowl, especially geese and ducks. In one place one observes the Indian, in his light frail canoe of *Thuja* bark, paddling noiselessly along to surprise the fowl behind the rushes; in another he is fishing with nets made of the twisted branches of the *Cornus;* or is busy in building canoes; gathering rushes for mats, &c. On the teeming meadows, graze or gambol herds of horses; children bathe in the river, or carry wood or roots to their humble homes, the smoke of which is seen circling over the tops of the gigantic pines. In short, it is as complete a picture of pristine nature as can be beheld under a northern sky.

These lakes are either permanent, filled with *Nuphar advena, Menyanthes, Typha* and rushes; or, they dry up to swamps in the summer months; in the latter case they bear *Phragmites communis* and *Alismaceæ,* their stony shores bordered and ornamented with *Clintonia, Calliopsis Atkinsoniana,* species of *Allium, Nasturtium, Claytonia, Cardamine, Lythrum,* &c. Deeper inside are large tufts of *Carices,* groups of *Typhæ,* so useful for the Indians who use the blades for making mats; with it also grows *Calamus, the* roots of which the Indians use but little. But on the borders of willow-shrubbery grows the *Scirpus maritimus?* for whose tubers the Indians dig every autumn as if for potatoes, which they also cultivate.* The former have somewhat of a pear-

* The Skitsoe Indians, about ten or fifteen years ago, got possession of some potatoes from some of the fur traders, which they since have cultivated in their own way, and brought to a remarkable degree of perfection. This may perhaps serve to show how much depends, in the potatoe as in every sort of vegetable, on the selection of seeds or sets. During my stay with the Skitsoes, in November 1843, the chief used to walk about every morning, two or three hours before daybreak, in the woods, where the Indians had built their lodges, singing out in a loud voice the orders for the day; amongst others he repeated every morning: "Eat the small potatoes, save the big ones for planting!" This his people did for a long period. The size of their potatoes (English white) was not so

shape, their size is that of a hen's egg. I found the taste to be very pleasant, but not so as to rival the latter.

The rest of the valley meadows are either low and moist, losing the spring waters rather late, or elevated as high as the banks of the river. The former change their verdure three times during the warm seasons. When the water has all gone away, the *Carices* die down, and divers species of *Aira* appear in their place. Towards September these have done and *Trichodium scabrum* with *Panicum capillare* give to these tracts a coppery and whitish mottled color, out of which rise the golden flowers of *Coreopsis Atkinsoniana*, *Helianthus Hookeri*. *Asterea* 473 and *Helenium* 589. The dry elevated parts of the meadows belong exclusively to *Gamassia;* one bulb close to the other for miles and miles. Three other showy kinds of plants only did I recognize: *Veratrum viride*, *Ranunculus* 303 and *Castilleja* 294. The latter seems to belong to that valley only.

We now traverse the river and visit one of the great Gamass-prairies on one of the great plateaux of Upper Oregon of about 3000 feet elevation, situate between the upper Columbia and Kooskooskee rivers, famous for variety of scenery and floral beauty. After crossing the river and a lake encompassed by mountains to the north, we ascend the latter and travel the same course.* Having ascended the

extraordinary, but in quality they surpassed what I before and afterwards tasted in potatoes. In planting they laid the potatoes whole, in rows a little elevated, filling them afterwards up with soil about a foot deep.

* Here I beg the indulgence of the reader, to give an account of winter travelling in this region; for it would leave the botanist in too enviable a light to pass over this, and describe summer excursions only, which are certainly delightful.

"It was on the same road that I sat out from the Skitsoe village in the beginning of December 1843, to go to Fort Colville on the Columbia River, a distance of about 180 or 200 miles on the winter road. Not finding an opportunity to go in company, and finding also the prices the Indians demanded to guide me too high for my limited means, I, at last, came to the resolution to go alone, though utterly ignorant of the route and the country generally. Having exchanged a fine fat horse I commenced my journey under the auspices of a snowstorm, which increased, the higher

plateau, the path led us again into a grassy pine-opening, cor-

I ascended the wooded plateau. The third day in the morning, every vestige of a path had disappeared, the storm continued, and the depth of the snow made it impossible for me to proceed further onward, the more so as I had lost the path entirely, being in the midst of a lightly wooded plateau. To return was now the only alternative left for me, but to find my way back another difficulty. I now dismounted again and struck a camp, hoping that by waiting a day or so the snow storm might abate, that I might be enabled to see a little at a distance. I built myself a shelter of spruce branches, lit a fire, gathered wood for the long night, and finally worked two to three hours very hard to free a space of ground from snow to make grazing easier for my horse, who, moreover did not like this stormy climate and seemed impatient to return to the valley, which compelled me to 'hobble' him; that is, to tie his fore feet together with a leather strap. Two of the dullest days of my life did I spend in this wretched camp, on a bed of spruce branches, watching the fire and my horse, but the storm continued with unabating fury, the snow now averaging three feet in depth. On the morning of the third day, I resolved to return at any risk, striking an easterly direction by my compass. I took my horse by the reins, and with the hatchet in my right, I commenced marking the trees as I passed onward through the deep snow, avoiding defiles, till late in the afternoon, when I found myself at the verge of a sudden slope towards a narrow valley below, in which I recognized black spots indicating a rivulet; descending with some difficulty, I was much pleased to find a path a little above the valley, which I followed, and brought me to the crossing place of Cœur-d'Aleine River in the afternoon of next day. The snowing now changed to rain in the valley, which at last fell heavily, so I hastened to get myself across the river. No canoe being on this side, I had no alternative but to swim for one; to do that I had to break the thin ice with my hatchet on my way, which had filled the open space since my late passage. Cold soon drove me back to the banks to light a fire, which I did by discharging one of my pistols into a heap of fine dry Cedar or Thuja bass, which an Indian had hidden under a piece of an old canoe. At last, after several swimmings and landings, I made the whole distance and brought over a fine canoe; one of those frail things mentioned above, made of Cedar or Thuja bark and basket willows. First, I brought over my saddle and saddle-bags, returning again I took my horse on the line, and warming myself through, stepped in the canoe to swim my horse across, when he suddenly turned back frightened, upset me with my frail canoe. Now I had to swim once more, but this time with my clothes on; however, I soon managed to push myself on the other shore with the canoe, which

responding with the former, but more wet and traversed by

got broke against the ice by this operation. I now had to take my saddle and saddle-bags on my back, and travel five to six miles in rain and storm along the banks of the river, while my horse was trotting and neighing triumphantly on the other side, with head and tail upright. Patiently I marched on through meadows and morass, and arrived just at about dark, at the village. Rushing to the fire in one of the Indian lodges, I was laughed at heartily, for every one could easily guess what had befallen me. At last, an Indian woman having amused herself a long time, by my vain efforts, to free myself of my buckskin shirt, gave me a helping hand. The sensation of wet buckskin on the skin, can only be compared with that of taking a frog in the hand."

The foregoing account I could have omitted, was it not connected with the one following. To give it so that the reader may get at least some idea, I have thought proper to give every detail of the winter-excursion. Perhaps he may get impatient, on account of the length; but I am sure he will not envy me.

"One would think that this would have been sufficient to make me stay where I was, and at my return I thought so myself; but, after three days had elapsed I heard that some Indians were going to drive a number of horses to a certain good pasture, the road they had to go was partly the same as to Fort Colville. I concluded to join them, as they promised to bring me on the right track. Not in the least did I dream that this adventure would outdo the former; but, prepared for a journey of four days, crossed the river where I found the Indian who had caught my horse, where I saddled him, to join my party. They, however, had lost some horses in the woods, for which they were searching; towards evening they came, but as it was too late now, we had to camp at the crossing for the night; hobbling our horses we lit a fire, and resolved to start as early as possible next day. A stormy night set in again, accompanied by pelting rain, which lasted for three days. On the third day towards noon, our roads parted. I got my information from the Indians how to travel on, but I found that these Indians have not that aptness to describe a route, so as to understand it at once, which I so often admired with the Indians of the Plains. I understood what he marked on the ground; to follow it strictly, I copied it on a piece of paper. Accordingly, I had to take the second trail on the right, after following the path I was in for a short distance. This I did. Soon I found that I was ascending again a wooded plateau; this made me distrustful of my road, so I instantly returned, examining the way again; finding however that I was perfectly right, I resolved to travel on as fast as possible. The fifth day I was again on a crested high plateau, snowy stormy weather again set in, but this time

numerous rivulets. Large tracts of ground are covered with the

accompanied by a piercing wind; however, I kept my road steadily, it was one that led to a distant Gamass prairie or root-ground of the Indians, frequented therefore by numbers of pack-horses, who had, in passing with their loads, snatched the bark from the pine trunks, which marks helped me to find the path again when I lost the track. Soon I became uneasy again as to the right way, knowing that my course lay northward, I found by my compass that I had pursued a south-easterly direction for the last three days; so that instead of wide plains and rivers, I had met only small valley prairies with rivulets. I now returned again, convinced that I must be wrong. This was the eighth day since I started from the village, with provisions for four days only; consisting of dry buffaloe meat and Gamass bulbs; these I had to manage now well, so that a third part of a breakfast was now my ration for the whole day. I had no rifle with me to kill game, nor did I meet any, except a moose-deer, which by its lazy amble kept my tired horse soon out of shooting distance, both with rifle and pistol. The snowing had now ceased; but the ground was covered two feet deep, and the labour I had every evening to free a piece of grassy ground for my horse, was very tiresome. In the evening, when I struck camp, I had first to gather wood for a fire for the long night, which lasted from four o'clock in the afternoon to eight in the morning. Above three hours passed in labour, the other long part I passed in sleeping, smoking, stirring the fire, looking for my horse and so on. When hunger pinched me, I smoked tobacco; to allay thirst, I kept several snow balls near the fire in front of my bed, the latter consisted of spruce branches, which I licked when they were thawing. Here I cannot omit to say at least something in favour of smoking tobacco; and in no other way, I think, can smoking be excused as any thing like being useful or necessary. The most pinching hunger and that peculiar faint feverish sensation accompanying it, is at once removed, as well as the sharp appetite, by smoking tobacco. The luxury of a pipe of tobacco, in such cases, cannot be conceived by any smoker, if he has not experienced it. The excitement is naturally soon over, and increases the more the stomach is tortured by fasting. A frequent repetition is therefore necessary. True, that a certain debility of the stomach must be the consequence; but this cannot outweigh an expediency so great, when life is in the other scale. But little progress did I make in my return, owing to the snow and the feebleness of mine as well as of my horse. On the third day towards camping time, I noticed by the marks on the pine trunks, that a path forked off to the right. Striking my camp at the place, I walked a distance and convinced myself that it bore a north-westerly course. Next morning I followed it, and found, to my great

two low species of *Vaccinium* and the *Arbutus uva ursi*. In

satisfaction, that I descended considerably. Already at noon, the snow began to disappear, my path became plainer, and at last brought me to a narrow rocky defile, when after another descent I observed a wide plain stretched before me, with but little snow and plenty of fine grass. The afternoon was beautiful, and my horse trotted on briskly along a woody seam of basaltic rocks. About sunset, I observed four horses grazing in the plains, which made me believe that I must be near an Indian village. Believing that some of the people might come and see after these horses, which they commonly do every two days, I resolved to camp on the spot; and to be easily recognized I put fire to a dry pine, covered with resin which burnt the whole night like a torch. A bright beautiful night ensued, which I enjoyed, feeling some hope of being now near the end of my trying excursion. The sun rose beautifully above the snow towering mountains next morning, when my horse came to my camp-fire voluntarily, having had an excellent grazing night. The four other horses also were only a short distance off. Mounting and proceeding onward I met several paths forking off from the main, and while I checked my horse, not knowing which one to take, my eyes caught at the distance an object which turned out after a minute or two, to be an Indian on a white horse, galloping over the plains towards the smoke column of my burning pine tree. At once I put the heels to my horse and dashed up to him. A short parley in words and signs ensued, of where we came from and where we were about to go to. I understood from him that I was on the direction both to Fort Colville and the Spokan Mission station. He was an old, coarse and wild-looking fellow, but agreed, and was willing at once to bring me to the crossing place of Spokan River, for which he asked seven balls and powder, a high price in that country for a two hours' ride. The passage through the river was rather difficult, the crossing place being immediately below a high water-fall. After I had paid off my guide, and smoked a pipe with him, he turned very civil, and accompanied me a short distance further, showing me the road afterwards to the nearest Indian village. For this additional trouble, he again asked to be paid by some flints and a piece of tobacco, which I did. He returned to fetch his horses. Trotting along a series of trap rocks, covered with scanty pines and tracts of sandy woods for three or four hours, I found myself at once on the brink of a precipice, overlooking a small river in a narrow valley below, and discerned an Indian village on an elevated bank opposite. To my right, I recognized Spokan River in a rather broad valley. Both rivers joined a short distance below, and enclose a point of land of classic reputation in Oregon; namely, the place where the trading-company led by the great pioneer Wilson P. Hunt, of St. Louis, built their first trading post, which was the first that was surprised by the British North West

such woods, but on sunny spots grows the rare and robust *Swertia* 335, with many litmus-coloured flowers, the panicle

Traders. Nothing remains now but a little elevation of the place where the chimney stood.

"Seeing so many paths I made directly for the village, which looked pretty neat; the lodges were constructed of thick poles, covered with new rush mats in the shape of our house-roofs. A great number of men, women, and children surrounded me as soon as I had dismounted in the village, but contrary to what I was used to, the tone in which I was spoken to, by two or three saucy-looking young men, especially by a half-blooded ferocious youngster, did not please me at all. When I asked for the road to Colville, he said he did not know, demanding in the same harsh voice sundry things, especially tobacco with every possible ill grace. At my refusal he changed his language to a still more offending manner which brought me a little in harness; the more so as the rest not possessing the same boldness, joined in a kind of sneer peculiar to the Indian only. I leaned on the neck of my horse, holding the reins in my hand, keeping myself quiet, when the former insolent fellow undertook to examine my saddle-bags, not daring, however, to take them down; while the others felt the mane of my horse, whose fat condition seemed to excite their appetite for horse-flesh, which these Indians are very fond of. This was too much for me; I lifted up the bear-skin that covered my pistol-holsters, took out the pistols, and placed them in my belt. This manœuvre succeeded, and brought them at once to better grace. They imagined me to be, in their own saying, 'a poor fellow without a gun.' The insolent half-breed lost more of his tact than the others; he stepped back amazed, crying out 'Stem!' (what!) pleading some ignorance to hide his fear. For this, I took out a pistol, levelling it at him with a doubtful laughing mien, imitating suddenly the sound of the report of a gun with my full voice. At this he shrunk visibly; he was now laughed at by some boys. Without looking at any one I swung myself into the saddle to be off. Three or four came forth now to show me the road, for which I gave them a little tobacco.

"I was glad to find myself alone again. The afternoon was beautiful, and I enjoyed the picturesque scenery along Spokan River, the path leading right above along the high banks of the same. At sunset I struck camp under a gigantic(*a*) *Abies balsamea* near the river. I made a shelter of a blanket, and stretched on my bear skin, I mused over the changes of the day, and

(*a*) In this tree were sundry marks hewn and cut. Amongst others, I found the initials (D. Dgls.), which I take to be those of the late Mr. David Douglas, who made a summer excursion to this place.

developing only after the flowering is over, when the plant attains a height of two to three feet.

Open moist meadows, adjoining to these woods, are traversed by small rivulets, which in their course pass through thickets of *Willow, Cornus* and *Symphoricarpus*, filled up with the tall fronds of *Pteris aquilina.* In the woods, these rivulets are bordered by *Abies, Populus, Acer* and *Alnus*; here grow abundantly *Ribes*, 313, with *Pedicularis*, 422, the latter is seen also in the meadows, but is quite a rare plant. *Carices, Aira* and *Gamassia* form the capet of these wet spongy meadows; of conspicuous plants are *Veratrum viride, Valeriana,* 237* and 308, besides *Thermopsis,* 365 near

over past times, for it was Christmas Eve. While I was so sitting and smoking a pipe, another Indian came up on a white horse; riding up to my fire he bent himself over his horse's neck, looking at my saddle, at myself, and the fire, for several minutes—this with an air of nonchalance which all North American Indians possess—at last I motioned him to dismount, which he did. He was a half naked youngster with a dejected countenance, who soon let me know his ill-luck, that he had lost every thing, gambling with the Sayelpies at Fort Colville. He also told me, that to go to the Mission establishment I had to cross a high snowy mountain. He stirred the fire, and fetched more wood for the night, watered the horses, so that I offered him a smoke, which he greedily accepted. After it I got out the small remains of the provisions, which I shared with him. Again we had a smoke, during which I made him the proposition, to guide me to the Mission next morning, which he promised. The pay was a saddle-blanket. Early in the morning of Christmas day, I followed the Indian over the mountain, the top of which was wrapped in a snow storm; towards noon we began to descend, and soon arrived in the valley Tshimakain. Soon I shook hands with Messrs. Eells and Walker, and accepted the permission joyfully to make myself at home in their residence.

"In my 'Preliminary Remarks' to these notes, I have already spoken of these kind gentlemen, and I state here, that I shall remember their kindness throughout the whole of my life. The sudden exchanges from hunger and cold in the wilderness, for the comforts of civilized life were not without a reaction on my health; but in three days the revolution was over, and I could enjoy the luxury again of sleeping under a roof, of which I had not had an opportunity for eight long months in succession."

* This is the "Racine amare" of the Canadian voyageurs. A robust, glaucous, and somewhat succulent plant, with cruciate entire and pinna-

the borders of the woods, and the delicate rare *Ferula*, 302, with *Arabis?* 305, on or between the tufts of the *Carices*. With the intention to return once more in July, we close this description of the *Green mountain*, or *Grassy region* of Upper Oregon. Passing down a northerly defile, through a shrubbery of *Prunus, Sorbus, Cornus, Myginda, Lonicera*, 304, and others, we arrive at last below, to overlook the

II.—Sub-region; Level Region of Upper Oregon: having before us,

1*stly. The fertile grassy and Gamass prairies*, of about 3000 feet general elevation.

2*ndly. The arid basaltic plains*, mostly to our right, of about 2000, and

3*rdly. The high, cold, grassy Ferula prairies*, of about 4000, to our extreme left.

All these plains incline eastward on the Green Mountains; the first and last on the Blue Mountains, westward; the second bordering both the latter, and preceding, by following and including the Columbia River, down to the Cascade Mountains.

1*st. Fertile grassy, or Gamass plains*, of about 3000 feet general elevation;

They are traversed by rivulets of secondary size in every direction, running swiftly along on a bottom of gneiss rock; overflowing, during the spring, the vast rich prairies, and leaving behind pools and ponds, drying up about July. They are further characterized by naked barren hills, ridges, or even mountains, to more than 1000 feet elevation above the

tifid leaves. The root is somewhat parsnip-shaped, thick and firm, brown and with a bright orange under epidermis. Raw, it has a somewhat pungent and spicy taste; but properly prepared, I am told by Sir Wm. Stewart, of Murthly Castle, Scotland, it is a very agreeable and wholesome dish. Sir Wm. Stewart cultivates this plant already for many years, and with great success, in his kitchen garden, where I saw it in the greatest perfection. The Indians dig it throughout the year, and boil it in the same manner as Gamass; by that process the root assumes a texture like that of boiled beet, a brown colour, and an odour with somewhat of the taste of chewing tobacco. Hence the Canadian name, "Tobacco root." The flowering panicle is a glomerulus, but the seed bearing elongated and 2-3 feet long.

plains, composed of soil, rarely topped, or walled, with granite or gneiss; void of vegetation, save the scanty grasses scattered over them, their chief vegetation being some inconspicuous *Boragineæ*. These mountains serve as landmarks to the traveller; one of them, more than 1000 feet high, was pointed out to me, as having a spring on its top. Stripes, or tongues of pine forest, on sandy elevated lands, give to these wide flat Gamass prairies a pleasing interruption; some of the most colossal trees of *Pinus ponderosa* are also found in these limited forests. This completes the general outlines of these plains; we will now say something about the Gamass itself.*

A deep blue covers these extensive plains when the

* *Gamassia esculenta*, Dougl.? *Narthecium Squamash*, Pursh., *Phalangium Squamash*, Nutt., is an *Asphodelea* much resembling a common blue Hyacinth, the bulb likewise of about the same size, in texture and shape more like that of *Narcissus Tazetta*. The Gamass of Oregon seems to differ from the same in Missouri and Illinois; the former being more robust, has a bulb twice as large, shorter, stiffer leaves, and longer racemes with larger and more oblique flowers, of a light or deep indigo blue, rarely pure white. The pale blue faded colour of the Gamass on the east side of the Rocky Mountain I did not meet in Oregon.

The digging of the Gamass bulb is a feast for old and young amongst the Indians; a sort of picnic which is spoken of throughout the whole year. The different neighbouring tribes meet on the same plain and mostly at the same time, at the same spot where their forefathers met. Here the old men talk over their long tales of olden times, the young relate hunting adventures of the last winter, and pass most of their time in play and gaming; while on the women alone, young and old, rests the whole labour of gathering that indispensable food. They, especially the young women, vie with each other in collecting the greatest possible quantity and best quality of Gamass, because their fame for future good wives will depend much on the activity and industry they show here; the young men will not overlook these merits, and many a marriage is closed after the Gamass are brought home. I saw a young woman at the Skitsoe village, who had collected and prepared sixty sacks of good Gamass, each sack containing 1½ bushel; she was spoken of in the best terms throughout the village.

As soon as the Indians have returned from gathering the "Biscuit root," of which we shall speak afterwards, they begin to prepare for the Gamass grounds. The whole village is active in collecting the horses,

Gamassia is in full bloom, agreeably variegated with sundry

getting sacks ready, which are mostly of *Thuja* bass, or *Helonias* roots; and at last family after family leave the village, chatting merrily, and group after group arrive at the plains, where there all is bustle and activity. After dismounting, they strike their camp in the groups of tall pines; the boys take care of the horses, while the older people pay their visits from lodge to lodge. Hunters return with game, or some young men bring the first salmon from the distant river, to have something to feast the visitors. All is merriment and joy, when the numerous large pine-wood fires illuminate the wide classic plain in the evening. The digging of the Gamass takes place as soon as the lower half of the flowers on the raceme begin to fade, or better, when the time of flowering is entirely passed. For that purpose, the Indian women use a stick two feet long, curvêd like a sabre, of hawthorn wood, which is provided with a cross piece of elk-horn on the top, serving as a handle. This instrument they use with astonishing dexterity, so that they very seldom strike the point twice after the same bulb. Four or five sacks of raw bulbs is a common day's labour, which dwindle to about two after baking and drying. With the first dawn of day the industrious women and mothers start from the camp, which is frequently a little distant from the Gamass plains, on account of wood and water. They are generally accompanied by a little girl or boy to take care of the horses, and they return every evening loaded to the lodge. As soon as they have gathered a sufficient quantity of bulbs, they prepare for baking. For that purpose, they dig or scrape a hole in the ground of three or four feet in depth, make a fire and throw in a good layer of red hot stones, then a layer of clean grass over those, and now a layer of Gamass, the latter having before been cleaned from the adhering soil. This is repeated until the hole is level with the ground above. The fire is now moved on the top of the pit, and kept burning for about twenty-four hours or longer.

The raw Gamass bulb resembles in its substance, the common Squill. By baking, it acquires a sweet taste, and when boiled the taste is not unlike the syrup of Squills, but not so sweet. Those accustomed to that food, like the Indians, remain strong and fleshy; but a European falls off very soon if he has nothing else. Eating a great quantity produces flatulence, as has been observed by travellers before.

As soon as the first Gamass are baked, the Indians, young and old, pass from lodge to lodge to eat Gamass: every where is plenty and content. The stranger is offered Gamass as soon as he steps into the camp. But this is only part of the feast: the whole is perfect when the salmon begin to be plenty in the rivers, when the gathering of Gamass comes to an end. Nothing can make the Indian recollect that he, with his family, hungered and nearly starved for two months. His natural carelessness and improvidence return with the abundant seasons, he

species of *Ranunculus*, especially R. 306. Of the many species of plants that here and there exist among the dense Gamass, but few come to perfection; generally one sees the panicles of *Trichodium* and *Aira* above the dry stalks, mixed with a few *Compositæ*, as *Aster*, *Solidago*, *Calliopsis*, &c. On the margin of ponds I found *Myosurus minimus*, *Isoëtes lacustris*, with *Alopecurus geniculatus*. The Gamass plains become more and more limited on approaching the Koos-Kooskee, or the Columbia River, where the rivulets become larger, the elevation less. Then again they take the shape of the small fertile meadows, included in such forests as we just left on the Green Mountain plateau. These meadows harbour abundantly divers species of *Trifolium*, but none of the involucrate species, which only grow on stony soil. Here I gathered *Trifolium*, 379 and 450; the former I did not meet again; further, the elegant *Polygonum*, 405, with *Iris Missuriensis*. The low gneiss ridges, clad with pines on top, are the habitat of *Erysimum*, 399, *Saxifragæ*, 619 and 625, and divers *Ferulæ*, 301, 298, with *Phlox*, 371, and *Phacelia*, 463. Sunny protected situations are inhabited by the pretty *Pentstemon*, 515; and *Poterium*, 467; joined below by *Clematis*,* 313; surrounded by *Phlox*, 375;

speculates away for trifles, or squanders, in gambling, night and day, the greater part of Gamass and other provisions, and imparts profusely of what he has, to those even who are too lazy to lay in provisions for winter. For this they have to suffer severely, particularly in the months of February and March; when they are compelled to fell trees, to gather the long moss from the pines, which they bake in the same manner as above, mixed with a few Gamass if they have any left. This composition is of a greenish-brown colour, like Confervæ, has a wild acrid taste, like tan, so that one would think it would reduce a living man to a mummy. But the stoical Indian eats this now with the greatest complacency; remains strong and vigorous, and it is possible that the absence of tannin in our victuals, renders our stomachs so feeble; and on the contrary those of the Indians so indestructible by not removing those acrid particles.

* The Saptona Indians use the root of this plant as a stimulant, when horses fall down during their excessive races. They hold a scraped end of the root into the nostrils of the fallen horse. The effect of this is

Espeletia helianthoides, Potentillæ, Geum, 296; and again, *Gamassia, Veratrum, Polygonum,* &c. On dry shady hill sides I found the two *Carices,* 332 and 333; the former quite remarkable for its very large tufts, woody root, and long perennial hard leaves. Here, also, on some dry sunny gneiss rock, did I meet again with the *Draba Caroliniana!* which I have found before on the saline loamy plains of Upper Platte River; as ought to have been noticed in the description of that region.

This closes the description of the interesting Gamass plains, poor as they are in select plants, for the purposes of a botanist. We now change our course eastward; traverse a spur of the Kallispell; a part of the Green Mountains, to arrive in the:

2nd. or Arid basaltic plains of Upper Oregon, including great part of the territories of the Spokan, Sayelpi, Okanagan, Kallispell, Saptona, and Wallawalla Indians, as well as the rivers of the same names; besides great part of the Columbia, and other rivers. General elevation, about 2000 feet.

These plains comprise so great a part of Upper Oregon, that it will be necessary to treat the same as one vast region. Moreover, as they are of the greatest interest to the botanist, and possess a flora of the first order, we shall give the general character of the vegetation, after describing its surface, and consider the same under different subdivisions.

Surface and geological features.—This extensive region is generally characterised by an uneven, broken, stony, rocky, or sandy surface. Level, heavy, clayey, stony plains are surrounded and intersected by high precipitous piles of broken, or entire shapeless basaltic masses, alternating with sloping piles of gneiss, rarely granite. The basaltic masses are surrounded with deep sandy elevations, or separated by such ravines

instantaneous, it produces trembling; the animal springs up, and is led to the water to refresh its limbs. I have been told that it never failed, nor produced bad consequences. The scraped root leaves a burning sensation for half a day, if touched with the tongue.

from the level loamy plains. The sand, for the most part, covers solid basalt, which appears as if cast over immense tracts of land, but is for the most part naked. On the sand some scanty pines scarcely maintain life, except in ravines, and towards rivers, as well as in the immediate neighbourhood of the basalt masses. A basalt of a closer grain, but likewise shapeless, appears in series of low, rounded, conic heaps, as if baked, its surface scaling off in small conchoïdal fragments, like flints. These range parallel with the great masses, and generally protrude out of the sand. Towards the Columbia River these plains become more wooded as the elevation lessens, and their sides are sometimes again walled with the before-mentioned pseudo-columnar basalt; the more so as they approach to the côtes (several thousand feet high) of the Columbia River. The most western portion of this region is again saline sandy desert, borne on coarse gravel, and in part again on pseudo-columnar basalt.

General characters of the vegetation:—Scanty woods of *Pinus ponderosa* on the sandy rocky tracts, but large trees are found in depressions and plains of less height, and in narrow river-valleys ! *Celtis, Rhus,* and *Corylus* first appear on the west side ! —*Sambucus* and *Symphoricarpus* abundant in river-valleys !—*Ribes* and *Philadelphus* on rocky banks !—Brilliant colours characterize the flora of the herbaceous plants !—Chief habitat of *Clarkia pulchella, Lewisia rediviva* and *Collomia elegans*, characterizing the whole of this region !—Small-flowering *Onagreæ*, abundant in the genera *Epilobium, Clarkia, Eucharidium, Œnothera,* and *Gaura !—Umbelliferæ* abundant, chiefly in the genera *Ferula, Eryngium, Osmorrhiza,* and *Peucedanum !—Boragineæ* abundant in *Pulmonaria, Rochelia, Onosmodium, Cynoglossum, Hydrophyllum, Phacelia !—Polemoniaceæ* in *Polemonium, Collomia, Cantua !—Lewisieæ* in *Lewisia ! Pediculares,* in *Orabanche, Orthocarpus, Castilleja !—Cichoraceæ* in *Hieracium, Lygodesmia, Troximon, Crepis, Sonchus.—Inuleæ*; *Pyrrocoma, Gnaphalium, Antennaria, Espeletia, Chrysopsis, Inula ? Calycadenia !—Astereæ*; *Erigeron, Diplopappus, Chrysocoma, Aster, Solidago !—Heliantheæ*; *Hymenopappus,*

Helenium, Gallardia, Calliopsis, Blepharipappus, Bidens, Helianthus!—Anthemideæ; *Cotula Artemisia, Achillæa!—Ambrosiaceæ*; *Xanthium, Iva, Ambrosia!—Berberideæ; Mahonia!—Rosaceæ*; *Poterium, Potentilla, Geum, Rubus, Rosa, Spiræa, Purshia, Cratægus!—Leguminosæ*; *Lupinus, Hosackia, Vicia, Psoralea, Homalobus, Glycirrhiza!—Amentaceæ*; *Populus, Salix, Corylus, Betula, Alnus!—Coniferæ; Pinus, Abies, Larix, Juniperus!—Saxifrageæ; Saxifraga, Heuchera!—Rhamni; Rhamnus, Ceanothus!—Polygoneæ; Eriogonum, Rumex, Polygonum!—Ranunculaceæ; Delphinium, Anemone, Clematis!*—Single representatives of families! Abundant is *Lewisia* of *Lewisieæ!—Mahonia* of *Berberideæ!—Philadelphus* of *Myrtaceæ—Comandra* of *Thymeleæ!—Clintonia* of *Campanulaceæ!—Fedia* of *Valerianeæ!—Sambucus* of *Sambucineæ!—Hedyotis* of *Hedyotideæ* (rare)—*Arceuthobium* of *Lorantheæ!—Cleome* of *Capparideæ!—Sida* of *Malvaceæ!—Turneraceæ*; *Bartonia!—Sedum* of *Crassulaceæ!—Rhus* of *Terebinthaceæ!*

No *Papaveraceæ! Urticeæ! Violaceæ! Vites! Solaneæ! Jasmineæ! Amarantheæ! Eleagni?! Oxalideæ!*

Cactus! Cnicus! Euphorbia! Fremontia! Galium! Gentiana! Hypericum! Plantago! Ribes! Symphoricarpus! Marsilea, and *Allionia!* are all single representatives of families not very abundantly met with.

Of *Gramineæ*, and other endogenous plants: are abundant: Of *Festucaceæ*; *Festuca, Kœleria, (Bromus)*; *!—Hordeaceæ*; *Hordeum, Triticum, Elymus!—Asphodeli*; *Gamassia, Allium, Brodiæa!—Liliaceæ*; *Calochortus, Frittillaria, Erythronium!—Irideæ; Sisyrinchium, Iris!*—Single representatives of their respective families are the genera *Alisma? Panicum! Agrostis!* and *Narthecium!—Cyperoideæ* very abundant, but only one species of *Cyperus!*

Vivid colours mark this region.—Blue and purple eastward; and scarlet with golden-yellow westward. A glaucous green reigns in the herbage over the plains; a deep saturated green in the valleys.

We now divide this whole arid basaltic region into subdivisions or regions, as follows:

1.—*Subdivision; level, loamy, stony and grassy plains*, encompassed by sandy and scanty pine woods and basalt masses. As soon as the ground-water has disappeared in the early spring, these plains are at once clothed with the beautiful wine-red flowers of the handsome *Sisyrinchium*, 311; and almost at the same time appear the different tuberous *Ferulæ* in the adjoining sandy woods; the yellow former species, as well as the famous "Biscuit Root,"* mentioned before. The *Pulmonaria*, *Hydrophyllum*, tuberous *Claytoniæ*, *Frittillariæ* and *Espeletia helianthoides* are here all together, to live and die away in less than four weeks. The grasses are, as before mentioned, *Triticum* and *Festuca*, thriving well in the clayey soil, with a half-paved surface. This is the favourite soil of the robust *Espeletia*, 395; which often invests such plains, and especially their depressions. The whole plant has a strong turpentine odour, and the Indians cannot eat the thick sub-

* By the first rays of the warm sun in March or April, this humble useful plant emerges from the sand. In about two or three weeks, the plant is in bloom. This is the time when the Indians, especially the Saptonas and Spokans, turn out to gather its delicate tubers; which are commonly of the size of a small walnut, somewhat bread-shaped, but then they are at least three to four years old, far inferior to the thin spindle-form two year old tender tubers. The substance is farinaceous, snowy-white, and in the young tubers not entirely insipid. Like many of the tuberous plants in Oregon, this also has a very short time for vegetating above ground, for in three weeks after flowering, the wind sweeps already the dry stalks over the plains. These tuberous *Ferulæ* are to the Indians here the same as the *Cymopteri* on the Platte are to the Pawnees in Missouri territory. Another and more remarkable species of *Ferula*, is the "Pooh-Pooh root" of the Spokans, which I never met growing myself; and only know from what I could see from a few dried leaves, I found that it must be more than twice the size of the former, and according to all descriptions a rare plant. The tubers are of the size of a small potatoe, but somewhat bread-shaped, and contain, as the former, a white farinaceous substance, which has a rather strong, but pleasant aromatic odour and taste, resembling citron, which they keep for more than a year. The Indians gather them in but small quantities and file them on strings. It would be well for future botanists to get tubers and seeds for planting, as it would be a great acquisition for our kitchen-gardens.

fusiform root of this, as of the other species of *Espeletia*. Not much of interest can be seen in these plains after the *Sisyrinchium* has done flowering; a few plants of *Gymnandra*, 230; *Geum*, 296; with *Potentilla effusa*, and the *Pyrrocoma*, about June, are the lone, yet interesting plants, and we leave therefore these extensive plains to visit the

II.—*Sub-division: the adjoining sandy plains and woods!*

Extensive level sandy pine woods; resting on basalt, fronting with their sides the river-valleys, and a lower terrace of level sandy pine forest or gravelly sandy extensive plains. Here reigns the greatest diversity in the vegetation, which is by far the most interesting of Upper Oregon. All the early spring flowers of the other plains, with few exceptions, are here met with and many that I found nowhere else. Early in April blooms here a beautiful *Erythronium*, probably E. *grandiflorum*, of a deep golden yellow, which I did not meet on the left bank of Spokan river, but in its stead found the *Erythronium* 601. Soon after follow numbers of small spring flowers, all of them mentioned before, except *Vesicaria didymocarpa*, growing on dead sandy slopes, which I did not see again, since I passed the Sweet-water rocks on Missouri territory. A very rare plant is the *Hedyotis* 460, which I picked on the rocks at the Kettle-falls, near fort Colville, and of which I found only one specimen; in the same locality grow *Arabis aurea*, *Delphinium* 600, *Mahonia* and others. On the Gneiss rock slopes, grows *Rhus glabra* with shrubs of hazel and hawthorn, and under the pines above grow myriads of *Ferulæ*, tuberous *Claytonia*, *Espeletia*: further *Comandra* 634, *Stellaria* 324; *Stellaria*? 629; *Sisymbrium canescens*, *Veronica peregrina*, and a number of small alpine plants. Open tracts of these woods and the gravelly plains without, are the chief habitat of the remarkable "Bitter-root plant,"*

* Description of the "Bitter root" plant, or Racine amare, *Lewisia rediviva*, Pursh, (*Spatlum, Aboriginorum*).

Planta perrennis vernalis colorata subsucculenta. *Radix*, tuber farinaceum amarum, cuticula exteriori nigro-fusca, interiori rubro-auriantiaca. *Tuber* plantæ annuæ verticale, fusiforme; plantæ maturæ partitum,

the "Racine amare" of the Canadian voyageur. As it is, to my knowledge, not as yet accurately described, I shall sub-

ramis caudatis divergentibus fibrosis. *Rhizoma* incrassatum squamatum partitum, partibus congestis. *Scapi* numerosi erecti pollicares nudi teretes, basi foliorum cyclo circumdati, superne nodo unico ochreato; ochrea elongata appressa 5-fida membranacea, laciniis tenuissimis. *Pedunculus* solitarius uniflorus, in ochream scapi impositus; teres, superne incrassatus. *Calyx* pedunculo concretus, persistens, squamis imbricatis, 7, interioribus majoribus, appressis, amplis, planis; ovalibus obovatisve, rotundatis vel emarginatis, nervosis, membranaceis, viridi-purpureis, post anthesin scariosis. *Corolla* conspicua, roseo-alba vel purpureo-kermesina. *Petala* in cyclo continuo squamarum receptaculo affixa, solubilia, circ. 17, obovato-lanceolata acutiuscula, interdum obsolete emarginata; interiora majora, post anthesin in operculum calyptræforme contorta, fructus obtegentia. *Stamina* in fasciculos 7-14, unguibus petalorum adnexa, corollam subæquantia. *Filamenta* tenuia incurvata albo-rosea. *Antheræ* biloculares, erectæ, lineares, utrinque truncatæ, flavo-roseæ. *Ovarium* solitarium ovatum, uniloculare; stylus unicus. *Stigmata* sub 7 filiformia; ovula plurima funiculis longis filiformibus in conum congestis suffulta, stamina subæquantia rubra. *Fructus* carpellum convexo-conicum, operculo calyptræformi petalorum contortorum obtectus. *Semina* lenticularia, nigra, nitida, albuminosa.

Observ.—Root flexible; caudex capitate; scapes and peduncles succulent; leaves green, dying soon off; segments of the ochrea long and lax; peduncle dilated to a receptacle; nerves of the calyx, sepals radiating; petals remaining tender, membranaceous till they twist themselves spirally together, as in *Malva*; stamens remain with the petals; seeds resemble those of a large *Claytonia*, situated on long fascicles; receptacle flat with a fringed circle of a spongy mass from which the fascicles arise; colour of the flower that of *Cereus flagelliformis*, lighter or darker; colour of the scapes and peduncles, with the calyx sepals bright brick-red or paler.

The Indians, especially the Flathead tribes, value this root highly, and it is with them prepared with the marrow of the bison, the most dainty dish. It has also acquired fame among Europeans, and travellers generally use it in those regions as a very wholesome food, and it is prized in spite of its strong bitter taste, which resembles the bitter of the China-bark. The root is dug during flower-time, when the cuticle is easily removed; by that it acquires a white colour, is brittle, and by transportation broken to small pieces. Before boiling, it is steeped in water, which makes it swell, and after boiling it becomes five to six times larger in size; resembling a jelly like substance. As it is so small a root, it

join my description taken on the spot where it grows. So abundant is that plant, that those localities during the flower-

requires much labour to gather a sack, which commands generally the price of a good horse. Indians from the lower regions trade in this root by handfuls, paying a high price.

This plant was first collected by the great pioneer, Captain Meriwether Lewis, whose attention was probably directed to it by the Indians, who brought some of such roots to him. The collection of plants formed by Captain Lewis, came under the examination of Pursh, who named this plant in honour of the collector with the fitting cognomen "*rediviva;* because that specimen revived and grew again at Kew Gardens, after having been about three years out of the ground, between paper. I also myself, brought a great number of tubers with me, which doubtless would all have grown, had it not been for the excessive heat they had to sustain, by passing twice through the aequatorial regions on my way home. The heat caused them to throw up leaves, which weakened the tubers too much. However, two plants were growing well at Kew Gardens, but did not show any flowers as yet when I last saw them.

Six weeks at most, is the period during which the *Lewisia* vegetates above ground, for the whole year. At first the fascicles of leaves show themselves, soon after the scapes; as soon as the first flower begins to open, the leaves die away. The flower is only open during sunshine, and when fructification has taken place, droops down, or lays down on the ground. When the seeds are ripe, the peduncle and calyx become dry, the former separates from the joint of the scape, the calyx sepals spread wide open, serving as wings, and now the wind whirls it about, to plant the seeds, which as yet were covered by the cap formed out of the dried contorted petals, and which are held by means of the claws being forced against the inclining inner sepals.

The *Lewisia* occurs sparingly on the plains of the Upper Platte; quite abundant however on the Upper Clarke or Flathead River, which is, on that account, denominated "Rivière aux Racines Amares," by the Canadians. Far more abundant is the same on the above plains; generally pale in colour on rocky ground; but a very elegant plant in the sandy woods.

A chemical analysis of this root will shortly be given by my friend Mr. Crusius, here at Dresden, which will complete the history of this interesting plant, standing alone, to my knowledge at least, as a family in the natural order as well as genus and species.

(The above excellent description made from the living plants, will serve to correct some errors in our account from dried specimens published in the Botanical Miscellany, v. 1, p. 344 t. 70; and in the Botany of Beechey's Voyage, p. 344, t. 86.—Ed.)

ing time are clothed with a crimson or purple carpet. About this time begin the immense masses of small flowering *Onagrarieæ* to grow up, such as *Epilobium* 380, 229 and 231 in moist places; *Oenothera*, 546 and 547, *Epilobium* 545, with *Eucharidium*? 658. About this time begins the flowering of the *Clarkia pulchella*, clothing the whole region, far and wide in its purple. It is far prettier on its native ground, the largest plants forming a panicle from the base, covered with flowers, but the mass of them are one or few-flowering plants not more than 2 or 3 inches high. Wherever there is a nut-shell-full of soil on a rock, there blooms a little *Clarkia*; the next characteristic plant of this region is the *Collomia elegans*, following soon after the *Clarkia* has begun, and now are seen flowers and beautiful colours in every direction, as: *Pentstemon* 515; *Silene*? 519, *Ceanothus* 526, *Gnaphalium* 536 and 542, *Phaca* 562, *Aster* (*Eurybia*)? 586, *Hieracium* 593, *Calochortus* 618, *Pentstemon* 641, *Gnaphalium* 643, *Phlox*? 480, *Erigeron* 478, *Townsendia* 479, *Homalobus* 475, *Pentstemon* 477, (very rare), *Cynanchum* 449, *Aster*? 447, *Lygodesma* 440, *Ipomopsis* 434, *Chrysopsis villosa*, *Silene* 385, *Crepis* 336, and several others; here also grow the *Gramineæ*, *Kœlera*? 537, *Hordeum* 542, with *Triticum* and *Festuca*, 356. Another sort of flora is found in the gravelly and sandy plains, though occasionally are found some plants from the woods in them, as the *Lewisia* and several *Onagrarieæ*. Generally they exhibit fine groups of *Eriogonum*, of which each small district seems to have another species, as I have observed from the Platte hills to the Columbia. The most conspicuous of the genus is perhaps *Eriogonum* 425; as other species do, this also forms a brushy mat on the coarse gravel or basalt-rock, sometimes three or more feet in diameter, showing its cordate-hastate woolly leaves during the winter. In the time of flowering one observes that each plant or mat bears flowers of a different tint, from cream-white to a deep gamboge yellow, in large regular cymes, which are often 8 to 9 inches in diameter, and with the scape near a foot high. Those on naked basalt in the next sub-

region, produce all deep yellow flowers. This plant has a very pertinacious parasite, the *Orobanche* 369, growing copiously on its roots. It is further very abundant on the stony valley of the Koos-Kooskee River, where I found it growing with *Eriogonum* 396, the latter being thoroughly covered with a silvery tomentum. I never met with it again afterwards. There remains a cymous-paniculate species, like the rest, covered with a woolly hair, but with a colour between white and rose: it forms large groups in the sandy valleys, this is *Eriagonum* 590. On stony exsiccated places I collected *Ambrosia* 551, *Cynoglossum*? 260, *Cantua* 544, *Rochelia* 548, *Delphinium* 420, and *Lythrum* 591, growing with masses of *Hosackia Purshiana* and *Gratiola Missuriensis.* The finest plants in these plains grow in the gravelly sandy central parts, and near rivulets. Among them is the delicate *Gypsophila*? 535, *Orthocarpus* 465, with tricoloured bracts, tinged with pink; further, *Orthocarpus* 540, very rare, *Pentstemon* 464, *Poterium* 467, *Anemone cylindracea, Hosackia* 553, *Calycadenia* 408, 409, *Erigeron*? 478, 571, *Stenactis speciosa, Gallardia* 35, *Galium septentrionale, Dianthus*? 466, *Helianthus* 34, *Hypericum, Lupinus* 390, *Sida* 404, and *Sida* 410, with the different small involucrate *Trifolium,* grow along the rivulets, with *Ranunculus flammula,* and *Spiraea Douglasii,* Roses, etc. In the few pools grows the *Claytonia*? 531, and on the border besides masses of *Gratiola,* the *Alisma* 439, *Carex* 190, 416, 417, 491, 492, 516, and 573, the latter a rare species here; also the *Junceæ* 208, 498, 499, 500; further *Aira* 342, 555, and *Agrostis* 572, with *Allium* 584, *Polemonium* 530, and *Aster puniceus* 587 and 633, together with many more; but as we have had a view of it sufficient to show its character, we will reserve part, and only notice those with fixed localities at the end of the next subdivision.

(*To be continued.*)

Description of a new Genus of HYDROPHYLLACEÆ, *from California.* By W. H. HARVEY, M.D. M.R.I.A.

(*With two Plates,* TAB. XI. XII.)

Among Dr. Coulter's Californian plants are two remarkably handsome species of *Hydrophyllaceæ* with larger flowers than any others of the order, and belonging, as far as I can ascertain, to an undescribed genus. I have thus the opportunity, of which I gladly avail myself, of conferring on my friend Francis Whitla, Esq., of Belfast, a deserved compliment, by giving his name to the genus. To Mr. Whitla's voluntary and unremitting exertions, the prosperous and advancing state of the Belfast Botanic Garden is mainly to be attributed; and the good service which he has thus rendered to Botany, ought alone to entitle him to the gratitude of botanists, a gratitude usually expressed in this manner. But besides these important services Mr. Whitla's ardent attachment to botany, intimate acquaintance with the plants of Ireland, and discovery, in this country, of the *Equisetum elongatum*, amply entitle him to a distinction of this kind.

WHITLAVIA, *Harv.*

Calyx quinque-partitus, sinubus nudis. *Corolla* hypogyna, tubuloso-campanulata, tubo inflato calyce multo longiore, intus basi squamulis quinque staminibus oppositis iisque adnatis aucto, ore subconstricto, limbo quinque-lobo, subinæquali, patente. *Stamina* 5, squamulis corollæ adnata, exserta. *Ovarium* spurie biloculare, placentis carnosis maximis. *Ovula* plurima. *Stylus* exsertus, bifidus. *Capsula* subcompressa, unilocularis, loculicida, valvis medio placentiferis. *Semina* numerosa, tuberculata.—*Herbæ* Californicæ, *caulescentes, annuæ, glanduloso-pubescentes. Caules erecti, flexuosi. Folia alterna, longe petiolata, indivisa, ovata, grosse crenato-dentata, hirsuta. Flores racemosi, speciosi, albo-cærulei, pedicellati, pedicellis gracilibus, se-*

cundis, patentissimis, glandulosis. Genus ad Eutocam *proximum, corollæ forma diversissimum.*

1. Whitlavia *grandiflora*; caule diffuso flexuoso, corollæ tubo calyce duplo limbo triplo longiore, squamulis oblongis obtusis, genitalibus breviter exsertis. (Tab. XI.)

Hab. California, *Dr. Coulter*, (N. 492). Tube of the corolla inflated, an inch in length and six lines in diameter, limb one third of an inch long.

Tab. XI. fig. 1. Corolla laid open; showing the staminal scales: *magnified.*

2. Whitlavia *minor*; caule erecto gracili, corollæ tubo calyce triplo limbo vix duplo longiore, squamulis apice emarginato-bilobis, genitalibus longe exsertis. (Tab. XII.)

Hab. California, *Dr. Coulter*, (N. 493). Tube of the corolla not quite two thirds of an inch long, and about 3 lines wide. Very nearly related to the preceding, but a taller and more slender plant, with smaller flowers. Not having very perfect specimens, I have omitted to take the specific characters from the leaves, which appear to be very similar in both species. (Tab. XII. fig. 1.)

The genus is obviously allied to *Eutoca,* and in the form of the leaves, glandular hairs, and general habit there is much resemblance to E. *viscida.* But the form and size of the corolla, and the squamular base of the stamens afford obvious generic distinctions.

When introduced to our gardens the plants now described will probably become as universal favourites as the *Nemophilæ* and *Giliæ,* which they rival or perhaps excel in beauty; and as border flowers, they may, with greater propriety, commemorate the services rendered to our Irish gardens, by the gentleman whose name they bear.

W. H. H.

January 19, 1846.

Botanical Notes on a Journey into the interior of Southern Africa, in company with Mr. Burke; by CHARLES L. ZEYHER.

(*Continued from p.* 134.)

We proceeded on our journey the next day towards the Caledon River, from which we were scarcely seven or eight miles distant. We passed several stationary parties of Dutch emigrants, of whom a considerable body occupied that peninsula between the Orange and the Caledon Rivers, and also the banks of both rivers. Although the banks of the Caledon River are shaded by large willow trees, (of *Salix Gariepina*, Burch., if I am right) they are scarcely visible from the level ground near to the river, on account of a narrow embankment, more than fifty feet high. As the plains, through which that river runs, are chiefly composed of a rich alluvial soil, in many places of a considerable depth, it is evident that the water, during a length of time, has cut so deep a gulf down in that soil; which is the more probable, when we consider the rapidity of its current. We intended to ford that river the same day, immediately after our arrival, but we were much disappointed, finding it in such a high state, that it would have proved fatal, if we had attempted to cross it, on account of the strong and rapid current, and the rocky nature of its bed or bottom; large masses of rocks were lying on both sides, which could not be seen on account of the muddy colour of the water, between which the waggons have to pass to the opposite side. We determined for that reason to wait for a better opportunity; the weather seemed favourable, and no rain had fallen since the last two days, so that we expected the river to be much lower again the next day. On account of want of experience, as to the great distance of the first sources of that river, running for a great length of its course through a very mountainous country, where a great quantity of water is soon collected in its channel during

rainy weather, we found our reckoning in this instance far short, and instead of finding the river lower the next morning, its surface was standing much higher than the day before.

After we got more experience, we perceived that the time of the arrival of the greater bulk of water in those periodical rivers depends on the distance, at which the thunder showers have fallen. As there is generally lightning visible during night without thunder, after thunder-showers have occurred the same day, we sometimes were surprized when ten or twelve days afterwards, we observed such lightning towards the horizon in the direction of the sources, with an unusual rise of that river, although we had fine weather several days before in our neighbourhood; at other times the great bulk of water arrived much sooner, according to the distance where the rain had fallen. Unfortunately, we waited for a whole month to see the river fall to a suitable depth, which would allow us to pass that stream with our waggons, but our hope was all in vain, and it never was so low as we found it the first day of our arrival.

Many parties, some of them emigrants, traders and travellers, had successively gathered on both sides, waiting, as we were, for a favourable opportunity to cross the river. There was neither raft nor boat by which we could effect our transit. We deliberated about building a raft of willow trees, which were large and numerous on the banks of the river; but on account of the strong current through the whole course, we doubted about its fitness, or that it could be used afterwards, to bring our goods over on it.

The rainy season had now completely set in, and there was scarcely a day without thunder-showers here or somewhere about our neighbourhood; and as the heat was very great during the day, which was more sensible on account of the moist state of the atmosphere, the growth and final envelopment of the vegetation went on very rapidly; the *Gramineæ* particularly, which form a conspicuous part of the Flora of those countries. Some species of *Andropogon*, and *Anthistiria*, grow three and four feet high here. The *Cyperaceæ*

are not so numerous here, but there are a few *Kyllingias*, and a small *Cyperus*, which is very remarkable on account of its bulbous root, very similar to the bulbs of *Trichonema*. They grow together in a very sandy soil. The partridges and pheasants are very fond of the bulb of this little *Cyperus*. Some herbaceous species of *Hibiscus, Hermannia, Phaseolus, Dolichos*, are the next among the *Dicotyledones*, which take a leading part here with regard to the number of individuals. The country about the neighbourhood of the river is rather hilly, which indeed has very little effect on the distribution of plants; those hills composed of red sandstone, possess nearly the same plants as the adjacent plains, a few hundred feet lower down, when there is a suitable soil for them. The plains, commencing at the foot of those hills, slope down towards the river, their surface occasionally covered with a reddish kind of sand, apparently the residuum of decomposed red sandstone rocks, of which these hills are formed, and which is carried down over those plains by heavy rains. Several Asclepiadeous plants, the *Mathiola torulosa* (17). *Semonvillea fenestrata, Thysantha subulata, Lotononis diversifolia, L. crumanina, Scabiosa* (779), *Pharnaccum* (624), *Limeum* (625 & 626), are the favourites of those sandy localities. The banks of the river, which are pleasantly shaded by large willow trees, are backed by a high cliff, rising immediately close to its edge, more than fifty feet high on some places from the level of the water. The average breadth of the Caledon River near to our station may be averaged from forty to fifty yards; but in the rainy season, when it rises considerably, its surface is much wider. The length of its course, it is said, is nearly the same as that of the Nu-Gariep or Orange River, but, running through a country of less elevated mountains, it is merely a periodical stream, with only a small run of water in the dry weather; while on the other hand, the Orange River is constantly supplied, even in the dry season, by numerous streamlets from the extensive Draka Mountain chain, which it joins at its north-

westerly side for a length of about two hundred miles. Both these rivers run through an extensive and apparently very mountainous country, girded towards the east and south by the Draka Mountains, and towards the west by the Wittebergen, till they penetrate the latter mountain chain, and join each other a few miles below our present station. That extensive tract, from the sources of both rivers, and belted by the two last mentioned mountain chains, is inhabited by the Mantatee people, belonging to several Betchuana tribes. They have chosen this mountainous country since the time they were defeated, and deprived of their original country by the Zoolo despot, Moselecatse. One of their principal chieftains is Siconyela, who resides between the sources of the Caledon River and the Orange River.

About ten miles' distance from our station up the Caledon River, lies a French missionary station, called "Sevenfontyn," which I once visited, at the latter end of 1836, when I attempted to go into Moselecatse's country by that route, exactly the same on which Captain Harris returned afterwards from the interior towards the colony. I was compelled, and most fortunately, to turn back on account of the appalling news that reached us on our route towards the Vaal River, that Moselecatse's warriors had massacred many of those emigrant families who had been obliged to leave the colony to keep their flocks alive, and who had chosen the banks of the Vaal River for a temporary relief. The news of that murderous affair caused great fear amongst my people, and compelled me to return again towards the north-eastern boundary of the colony. When I arrived at "Buffalo Valley," a place where we forded the Orange River, a short distance below the Wittebergen, we met the first body of the emigrants who expatriated themselves under the command of G. Maritz.

The missionary station at Sevenfontyn, (so called after so many springs rising immediately near the house of the missionary), is well inhabited, for the most part by "Bassootas," a Betchuana tribe, with only a few Hottentot

families, and one respectable looking coloured man of the name of Moses, who lived in the immediate neighbourhood of the missionary, evidently for their better self-preservation in time of danger. The Rev. Mr. Rolland, a very respectable and zealous missionary, received me with great kindness, and showed me his new gardens, as well as his newly finished building, and I must say, they were judiciously built, under present circumstances, to protect his own family and a good many others of his flock from the treacherous attempts made by the thievish Kaffir tribes from the southern shores.

The houses, or, more properly, straw huts of the Bassootas, several hundreds in number, are amphitheatrically erected, on the eastern slope of a considerably high hill. It had a very impressive effect, as we happened to travel in the dark of the evening, when approaching that station; we were much surprised by seeing the whole flank of the hill illuminated by many fires, coming from the interior of their huts, as most of the inhabitants were preparing their supper. The buildings of the missionary, as well as those of the Hottentots and the lower part of the Bassoota village, are erected on an eminence at the foot of that hill, and only a short distance from the Caledon River, commanding an interesting view towards the east, over the verdant and extensive dale below, with numerous herds of cattle, horses, and sheep. The Caledon River winds in a serpentine line through it, but its tall willows growing on the edge of low-water mark, could scarcely be seen, on account of a high embankment on both sides of the river. Many subsidiary hills rise immediately at the opposite end of that dale, till they are bound in the rear by much loftier tops of the Wittebergen. Mr. Rolland pointed out to me a place, down below, in the valley opposite the Caledon River, and only a short distance from it, where a number of about three hundred and fifty Kaffirs had been killed by the Bassoota people only a year and a half ago.

During the last Kaffir war, one chieftain belonging to the Ama Rosa tribe, whose name was Taloosa, finding no chance of satisfying his cupidity with colonial cattle, made an expedition towards the north, and entered this country in order to rob the peaceful Bassootas of their flocks. This attempt, however, was frustrated through the vigilance and valour of that tribe. Taloosa, with almost all his followers, was slain, and thus severely punished for his crime.

The King of the Bassoota's name is Moshee, (others call him Moshoosa). His residence and capital lie several days' journey higher up the river; it is built on an extensive table-land on the summit of a high mountain, which is surrounded by inaccessible precipices, a spot that has been very judiciously chosen by the king about the year 1824, at the time when he and his tribe fled before the victorious spears of the Zoolas, led by Moselekato. Moshoosa is described as being of a very peaceful disposition; there is scarcely any robbery committed by his people, and he lives on amiable terms with his surrounding neighbours, as well as with the colony. He rules over a numerous tribe, and occupies an extensive, but very mountainous country. A missionary station of the same French society is attached close to his capital, below that mountain, and some of his younger sons were placed under the immediate care of its missionaries at that time.

There are several other villages higher up that river, inhabited by Bastards, a mixed race of Hottentots, and the rest are Koranas. The latter are also a Hottentot race speaking nearly the same language. One of these villages, called Nieuland, has a great fame in that part of the country with regard to the abundance of wheat cultivated by this people. In time of scarcity it supplies many districts with its produce; so that even the inhabitants from the Natal country resort here with waggons, notwithstanding the distance is more than two hundred miles, to buy loads of wheat from this people.

There is scarcely any water running in the channel of

the Caledon River during winter, and the water in it is merely a string of pools at that time. Its water is very clear during this season, swarming with fish of several descriptions, enjoying themselves in shallow places in the beams of the sun, and making a great noise in the water. They are good for the table, but rather inconvenient, on account of the numerous sharp bones in their flesh. The *Sylurus Gariepinus*, Burch., and the *Barbus Marequensis*, Smith, are the best and the most numerous in this and the Orange River. Some peculiar plants grow in the shade of the willow trees, in a muddy soil, deposed by the flood of that River. *Urtica?* species, *Sonchus glaber*, *Lactuca*, (1037), *Thalictrum Caffrum*, (4), *Conyza*, (804, 805), *Senecio reclinatus*, *Conium africanum*, (745), the most of them, indeed, have much the habit and external look of an European flora, and contrast very much with the plants more remote from that river. The common reed, *Phragmites communis* likewise occupies great patches along the banks of that river. It is of no particular use about here, except that it serves the inhabitants to thatch their houses with. But it is to the inhabitants of the Karroo countries of great importance, as it is the only green vegetable in a severe drought upon which their cattle entirely depend, when there is no other green wholesome blade to be seen; it grows very luxuriantly, even in the most salt and brackish water, and fattens very quickly those animals. It is very interesting to see every evening swarms of thousands of birds, chiefly *Turdus gallinaceus* and *Lamprotornis bicolor* resort to these thickets of reed; they know that they have a safe night quarter here, for as these reeds grow in the water, no enemy can disturb them.

There are, in comparison to other places, very few birds of prey about the Caledon River; the *Milvus parasiticus*, a well adapted name, is frequently about the banks of the river, and is very annoying sometimes, when there is meat within its reach. He is rather too forward, and not too

shy to seize the red handkerchiefs from the head of the coloured people, taking it, on account of the red colour, by mistake for meat. The *Aquila vulturina* is very rare here, of which we only saw a few; it is a very shy bird, of a noble appearance and of great courage. I witnessed one day, with a Hottentot servant, on the Cedar Mountains, one of these birds attacking a tiger, or Cape leopard. We were standing on a precipice, looking down below, when the eagle drove the leopard back into its retreat in the rocks. The best way of shooting this bird, is by hunting with dogs in those mountains, as it is sure he will soon follow the party on the wing above their heads, in order to catch the hare, rabbit, or buck, which are started from their cover before the dogs catch them. They are more numerous in the Cedar Mountains, where we obtained eleven specimens by that mode of hunting.

We met, for the first time, the *Coracias Angolensis?* along the banks of the Caledon River. It is a fine bird, of a light blue colour, and is smaller than our jay. It feeds principally upon locusts and ants. A large species of *Ibis* lives also about the river; we received one specimen from a farmer, who shot it with a bullet, on account of its being so very shy, by which mode it was much damaged. Its principal colour is white, with black-tipped wings. It much resembles a stork, seen at a distance, from which it is however easily distinguished by its curved bill and short legs. I have seen once on the Stormbergen, about 6000 feet elevation, a considerable number of these birds; they were feeding on locusts, with which that country swarmed at that time.

The parties, who were waiting on both banks of the Caledon River for its fall, to a suitable depth, became every day more numerous, and the neighbouring plains, which are extensive, were filled with thousands of cattle and sheep; some belonging to emigrant and travellers, others to traders, who brought them from the interior for the markets at Graham's Town or Algoa Bay. Some of our neighbours, in order to

pass their time away, made frequently use of the cargo of a dealer in wine and spirits, who were, like us, on the way to the interior, and was arrested in his proceeding by that river. Merriment and joy were their first entertainment, which was often followed, as usual on such occasions, with fighting and quarrelling. Their party split one day in two, and they pronounced war with each other, and soon entered the field of battle with guns, instead of as formerly with clubs, or with the fist. We were no less in danger by this proceeding, as the party on our side of the river, without asking our permission, considered it safer to use, in such circumstances, our waggons as a battery, from which they intended to effect an assault; the ground being so level, and no other shelter here about. They were arrayed already in a line of battle, and considering their excited, frantic gestures, and yelling noise, we prognosticated a heavy musket-fire and some lives lost. After a short while, however, through the eloquence of their principal speakers, the matter was quite amicably settled, without there being a shot fired.

As there was no hope left that we could cross that river in any other way, except with the aid of a raft or boat, and the social intercourse with our neighbours becoming obviously every day more annoying to us, we were very glad, after some fruitless attempts, to persuade one farmer, belonging to the above-mentioned club, to borrow a boat from one of his relations, living at the Orange River, which was, however, very small. For that reason it occupied a couple of days before we effected our transit. We were obliged to take our waggons to pieces, and bring them over, piece after piece, together with the other things. We left the opposite banks directly after we had put every thing right again, calling first, as we went on, at several emigrant stations, about the environs of the Caledon River, in order to receive a number of sheep from them, as provision for our party. Having settled this matter, we continued our journey over a trackless plain, of very luxuriant vegetation, and bounded

by detached, flat-topped, sandstone hills, leaving openings through which we entered into other plains, till we reached the main route again, leading from the Caledon River towards the interior. The heat was very great about noon that day; in consequence, we experienced a heavy shower of rain; we proceeded on our journey during the most frightful crashes of thunder, till we were stopped at the foot of a little steep hill; the ground being too slippery for our oxen to bring the waggons up. We were detained here for another two days, the showers of rain falling incessantly; and after we went on again, we were surprized by other showers, which inundated for some time the level plain in a moment, and we had to wade often to our knees through the water along the route.

We passed a small river, a tributary of the Caledon, called the *Wilgespuiht*; the name is evidently given by Dutch emigrants of late years, who choose to travel over this tract; and on account of the many waggons of the emigrants which have travelled since that route, it is already as wide and open as the main routes within the colony. The country assumed an uniform and dreary aspect, the more we advanced gradually towards a more elevated region; its scenery, as well as its vegetation, presenting for miles, nearly the same things and objects in repetition. There is scarcely any bush or tree, except at the side of precipices on those hills with flat-topped summits, where the dark-looking evergreen, *Olea* (?) seems to be purposely called into existence, to conceal the dreary disagreeableness of the barren, rufous-looking sandstone rocks. The most extensive orders of plants prevailing about these regions are the *Gramineæ,* undoubtedly, with regard to the number of individuals; they became, however, more scarce as we went on, in comparison with the neighbourhood of the Caledon River. The increasing elevation of the country causes most likely that change, as also the great numbers of small and large game occupying the hills and dales of that undulated rugged tract; and which

are the only inhabitants who claim these lonely and dreary-looking spots as their home. We crossed here a few small branches of the Riet River, which joins the Madder River, or Maap; the latter is a tributary of the Vaal River; its junction with the latter is about 29° south latitude, and 24° 40′ east longitude.

Having travelled for some distance over an elevated crest-like ridge of hills, sloping towards east and west, we descended again from a moderately high ground towards an extensive plain; which we considered no great distance from Taba Uncha, the capital of Morocco, a Betchuana chief. It was already dark in the evening when we entered the plain. The soil was of a very stiff loam, and soaked with water from the heavy rains, with a surprizing luxuriant growth of grasses, chiefly *Saccharineæ,* which were, for the greater part, four feet in height. As the ground was quite level, and no accident was to be feared, we continued our journey in the darkness, with the hope of approaching Morocco's residence as near as possible that night. We were dreadfully annoyed by myriads of mosquitoes, which filled the air in columns, so that it was scarcely possible to take breath, for they were drawn into the lungs when inhaling the air, besides the annoyance of their smell. This plain seemed to be very favourable for these torturing beings, and we never met in any other place so many as here. The numerous fires on the hills in front, made us believe that we were near the capital, and we gladly unyoked our teams, which had a very hard pull over a stiff muddy surface that evening. We took our night quarters at the side of a small stony ridge, and hearing the voices of many people, we considered ourselves to be near the place of destination. We detected, however, the next morning our mistake, and that we only had approached the first outposts of Morocco's people.

The *Striga coccinea,* (n. 1277), a pretty little parasitical plant, inhabiting like *Orobanche Phelpæa* or *Harveya,* (n. 22,) and growing on roots of several plants, made their appearance

between the stones near our place, their lovely red large-lobed flowers, ranged in spikes, with their stalks seven or eight inches long, contrasting most agreeably amidst the green colour of other plants. A few *Hermannias, Solanum Melongenas* (n. 1258), and a plant belonging to *Gentianeæ*, and nearly related to *Sebæa* (n. 1192), with perennial roots, only five or six inches high, were added to our collection.

Some of Morocco's herdsmen, who had their temporary abode a short distance from our camp, and who presented us with baskets filled with milk for our early breakfast, in expectation of an equivalent in tobacco, informed us that we had to travel for several hours, before we could arrive at Taba Uncha. Many of Morocco's people passed our waggons as we went on; some were on their way towards the boundary of the colony. The men were armed, either with guns or with javelins; some were clothed in European dresses, others wore their national dress, made of sheepskin. They drove oxen before them, loaded with leathern bags, filled with the produce of their fields and gardens; such as Caffer corn, Indian corn, or pumpkins, they bring these articles to the farmers lately emigrated from the colony, who were living at that time near the Orange and the Caledon Rivers, and who have no cultivated land or gardens. They generally sell these things in exchange for sheep, or tobacco. At our arrival at Taba Uncha, we were agreeably surprized at seeing its extent and the peculiar construction and uniformity of their houses, which correspond so correctly with the faithful description from the able pens of Mr. Burchell, and Professor Lichtenstein, who visited many years ago some of these tribes, that it is hardly worth to repeat again what they have already so clearly explained, about the manners of these tribes, and their mode of husbandry.

Taba Uncha is the central place of the main body of the Borolongs, a sub-tribe of the Betchuana nation, who were conquered by the same Zoola despot, Moselekato, about

twenty-two years ago, and deprived of their native soil like many other tribes residing thereabout. They fled into Moshoosa's dominions afterwards, who gave them a suitable tract of land to occupy. The main body of that tribe have concentrated themselves since at this place, and have chosen it as the residence of their chieftain, called Morocco. The town consists of several hundred houses, and upwards of eight thousand inhabitants. A missionary station is attached to this extensive place, belonging to the Wesleyan Missionary Society, where the Rev. R. Giddy was the only missionary at that time, by whose indefatigable exertions it may be expected, civilisation and christianity will show ere long its beneficial effects over this interesting tribe. The real good effect of the labours of missionaries, however, will be felt more afterwards, when the children of this people have grown up, as it is one of the principal anxieties of that zealous missionary, to foster religious principles and good habits in the minds of the rising generation, that they may become afterwards useful members of society. A printing press is also attached to this station, superintended by Mr. Giddy, who showed us many sheets printed here in the Betchuana language.

The spacious plain on which the town is built, being considerably elevated above the neighbouring plains and valleys below towards south and west, serves as pasturage for their young domestic animals, and for those which they want for daily food or other purposes, and was stocked with many hundreds of several descriptions. Large tracts of fertile soil in the valleys and plains below were cultivated to a great extent, and planted with Indian corn, Caffer corn (*Sorghum Usorum*, N. ab E.), as also with pumpkins, and a small kind of bean. Other parties of this people, who serve as outposts, reside at a greater or less distance from the capital. We had placed our waggons and tent at some distance from the town, at the western extremity of a long ridge of a hills, opposite the house of the missionary, not wishing to be too

close neighbours to the natives, to prevent our people from becoming too intimate with the inhabitants, which often tends to serious misunderstandings between the parties.

As it was one of the chief objects, to collect the rarer kind of animals, and especially those of the Antelopes, as being the special favourites of the Earl of Derby; it was indispensable, we should visit such places, where we knew game was not yet exhausted by the guns and traffic of the emigrants, who already occupied the greater part of the country which was inhabited formerly by these animals. Knowing the rapid advance of the Dutch emigrants towards the interior, little hope was left that we should succeed, where they had already settled for a while; and we only expected success by going beyond their settlement, more towards the north into the interior. Considering the extent of country, which the Betchuana nation occupies, it was very probable, that we should fall in with some remnants of that tribe in those remote regions; we thought it necessary to provide us with an interpreter and guide, as the opportunity seemed more favourable here than at any further place. Mr. Giddy, to whose kindness and much valuable information, especially respecting this tribe, we are greatly indebted, communicated our object to Morocco, and by thus recommending us to the latter, we received two trustworthy men as guide and interpreter; and before we left the place, Morocco, with two of his brothers and several of his councillors paid us several visits, and seemed highly satisfied with the manner they were entertained in our camp.

The view at Taba Uncha, more properly called Tawanchu, is bounded by various hills, chiefly composed of a reddish sandstone; some of them rising to the rank of mountains towards its eastern flanks. Wood is exceedingly scarce here, and grows chiefly towards the higher part of these hills, where it is nearly already exhausted on account of the nume-

rous population of the town. The hills and dales are clothed with a fine verdure of grass and many other herbaceous plants. A little *Dianthus,* (n. 81); *Silene cernua?* (n. 84); *Hermannia,* (n. 105); *Corchorus serræfolius,* Burch., (n. 148!); *Lotononis calycina,* Benth., (n. 406); *Lessertia,* (n. 461); *Herniaria,* (n. 611); *Kohautia,* (n. 757, and another species, n. 759); *Helichrysum,* (n. 881); *Lactuca,* n. (1036); *Sebaéa,* (n. 1192); *Solanum,* (n. 1258); *Striga coccinea,* (n. 1278); *Alectra,* (n. 1311); *Rhytiglossa,* (n. 1398); *Boerhaavia pentandra,* (n. 1433); *Phyllanthus,* (n. 1507); *Euphorbia,* (n. 1543); were the principle species of plants flowering at this period about the environs of the place. The general character of the country with regard to vegetation is similar to that of the Caledon River, and is stocked with many species of *Cyperaceæ* and *Gramineæ* as being the predominant orders of plants here; of which are the genera *Cyperus, Mariscus, Kyllingia, Ficinia, Elinurus, Heteropogon, Andropogon, Anthistiria, Arthratherum, Chloris, Brizopyrum, Eragrostis, Brachypodium.* Owing to its elevated situation, the climate is liable to sudden changes from hot to cold, especially when the thunder storms prevail, of which we experienced a very awful one, one evening attended with a furious gale of wind, which tore our tent nearly to pieces, and broke the fold in which our sheep were kept during night. As they strayed about, through the accident, during the night, we had great trouble the next morning in finding them and bringing them together, and not without the loss of several.

When we left Taba Uncha, which is situated about 28° 35′ south, latitude, and 27° 30′ eastern longitude, we travelled a considerable way between many acres of cultivated ground, planted with various kinds of vegetables, promising abundance to this industrious people. The country in general over which we passed had an undulated appearance, and after travelling for a distance of about six miles, we fell in with another missionary station, called Ramootshe,

peopled by Koranas, a sub-tribe of the Hottentot race, with the same feature, language, and habits. We missed however here that industry which were so conspicuous about their neighbours we had left shortly before. It seemed they depend chiefly upon their stock of cattle and sheep; but many who have none or only a small number, are obliged to hunt after game for their subsistance; of which we witnessed several hundreds passing our waggons on the route. Some of them were armed with guns, others with spears, and followed by a numerous train of dogs when they commenced hunting on both sides of the route, the country here about being inhabited by thousands of game of various description. Judging from the houses of the missionary as we passed by, this station seemed to be established only since a recent date, and may grow to more importance in after years, by following the good example of their industrious neighbours. On passing by, we added several species of plants to the collection; one like an *Indigofera* (n. 473), a creeping *Rynchosia,* (n. 509); *Nemesia,* (n. 1264); *Lantana,* (n. 1371); a gigantic growing *Andropogon,* (n. 1799); *Andropogon,* (n. 1802).

The country became more open after we had passed that station, and as we travelled partly over an elevated plain, the view became more extended towards the Witteberg mountain chain, running north east and south-west, and inclining considerably in the north-easterly direction; where they presented also detached gaps, allowing a view far beyond, to a country seemingly of a very mountainous character.

As there was an abundance of game, we halted here one day, in order to shoot some for provision, and as we were straggling over hills and dales to realize our object, we fell in with a family of Bushmen at their temporary dwelling, which was erected with some boughs of trees, and covered with a kind of sedge. It was placed in such a position as to keep off the storms, and was covered on the weather-side. It

being erected on an elevated ridge, probably chosen by the inmates, for observing the game at a considerable distance, and to prepare them at their hiding-places for an opportunity of shooting them with poisoned arrows. Game was very abundant here; a great quantity of skulls and bones of these animals strewed about their court-yard, showed sufficiently that they were successful, and made frequent use of the wild animals which roam about here. We did not expect that there was any living being when approaching that place, till we were surprized by a lean, little and filthy-looking bushman, who was armed with bow and quiver, filled with arrows. He advanced towards us with marks of fear and curiosity; and although we tried, by making signals, to enter with him into conversation, it was all in vain; the wretched expression of his physiognomy left very little hope that he would understand any thing, except what is necessary for him to preserve his life in that lonely wilderness. He seemed much pleased with a present of tobacco, which has been, most likely, the reason of his servility, and for which he met us already at a distance from his residence, that he might have some of that highly esteemed narcotic. Remembering the fate of Captain Harris's team of oxen, some years previous, about this track, we took great caution to secure our team against any visit during night from these merciless butchers, and continued our journey early next morning.

Travelling for some hours over an open, but somewhat undulated tract, with some scattered flat topped hills, till we arrived at the height of a deep and wide valley, at the bottom of which the "Gy Koup," or Great Vet River runs, a periodical stream, which we crossed somewhat below its source.

In descending the slope on its left side, our attention was attracted by the change which took place with regard to vegetation towards that depressed locality, in the occurrence of several kinds of plants, hitherto not observed on our route, belonging to a more northerly and hotter climate.

Pterodiscus speciosus, Hook. (n. 1203), and *Menodora africana,* Hook. (n. 1132), seem to be only casual occupants of this remote region. Their occurrence here may be attributed in some respect to the depressed situation, and the shelter they receive from the high slopes on both sides of that river, against the cold and inclement weather which prevails on these more elevated plains during winter. The difference with regard to vegetation between an open country, exposed to the influence of cold weather and to the scorching south-eastern trade winds, and that of deep valleys or glens, sheltered against those disadvantages, is most remarkable within the colony, towards the southern sea-shores, which must strike every visitor of an observing mind with rapture when approaching the forest scenery in the mountains near the Plattenberg's Bay, or the deep ravines of the Louri and the Van-Stades Rivers. There the hills and elevated plains are clothed with short brushwood, or with herbs and grasses. Occasionally may be seen on these open tracts, some scattered clumps of shrubs, composed of species which grow, under more favourable circumstances, to lofty forest trees in the forests in the deep dells of the immediate neighbourhood. The air in them is ever moist, for the constantly blowing south-eastern wind has scarcely any access to it to carry off the moisture of the atmosphere, and being warmed by the rays of the sun, the heat is often very intense, heightened by the moisture of the atmosphere, so essential to the luxuriant growth of that peculiar vegetation. The want of protection against the influence of the scorching south-eastern trade winds seems a great hindrance to the greater extension of South African forest scenery over a more level and open tract of country. On some places, as at the Kneisna, Zizikamma, Krakakamma, the Olifantshoeck, where the expanse of the sea-shore is favourable for attracting the moisture carried by the trade winds passing over a great ocean, forests may be seen of considerable extent, spreading over an open and somewhat level tract; but even here they generally prefer the southern flanks of hills, facing the moist breezes

from the ocean, leaving the northern slopes of the hills open, covered with luxuriant-growing pasturage. It is quite enchanting to a stranger, who rambles towards the top of these rushy or grassy hills, in a southern direction, when he at once beholds before him an extent of dense tropical forest scenery, which he is scarcely able to penetrate. As the air is generally much impregnated with moisture about these depressed tracts along the sea-shore, the heat is very intense during summer, and, consequently, rains fall frequently, giving the freshness and luxury of a tropical vegetation.

We entered the temporary territory and jurisdiction of the Dutch emigrants immediately after crossing the "Gy Koop," or Great Vet River, and it seemed that several difficulties awaited us on its right bank. The emigrants had already heard of our approach, and that we intended to proceed through their territory towards the interior. As the greater part of them had no idea that we could venture on an expensive journey, only for the sake of science, they evidently suspected us to be spies. They suspected Captain Harris in the same way when he went into the interior. As it happened that I was at that same time on a journey towards the Vaal River, with the intention of entering Moselecatse's territory by that route, many told me that two officers went towards the interior, to present Moselecat with two loads of guns and ammunition, in order to enable that chief to attack the emigrants. The fact was, that Moselecat surprized and murdered several families of the emigrants some time before Captain Harris entered that territory. It was also fortunate that the Zoola's army had no fire-arms with them when they made the assault, otherwise they would have the more suspected Captain Harris, who showed himself afterwards to be their impartial friend in bringing before the eyes of the public at home the many grievances which brought them to that desperate resolution, to quit for ever the land of their birth. Many of them will scarcely dream of the good intentions that officer had in their favour, as they scarcely read any thing except the Holy Scriptures. It hap-

pened, by chance, that we met an emigrant who resided on that side of the river, just as we had crossed it, with whom I made several hunting excursions some years before, towards the Wittebergen, and who entertained us with marks of great kindness. We heard here the first intelligence of the early appearance of the horse sickness in the country, which proved a great obstacle in the way of our proceeding. As the great object of the expedition was to collect the young of the different kinds of antelopes, especially alive, we could do nothing without the aid of good horses; but seeing the approach of the distemper, it would have been useless to purchase these animals before the time of that disease was over, as it is considered that the greater part of the horses are swept off during its prevalence. As it was very uncertain if we could procure horses farther in the interior, we had to be content to wait in this part of the country till all danger was over.

As the emigrants had constituted a law, that no stranger should pass through that territory they occupy, without having their permission; we were warned already by some, not to proceed without the precaution of obtaining a passport from the Field-cornet of the frontier division. Being detained through the appearance of the horse-sickness, and finding sufficient employment in collecting natural curiosities, we did not hasten to make application to that functionary for our passports. The curiosity of that venerable gentleman, however, to see us, was very great, and did not allow him to wait for an application. He paid on the following Sunday a visit to our host, close to whom we had pitched our tent. As they were seemingly in fear of their surrounding barbarous neighbours, they prohibited the importation and selling of gunpowder and fire-arms to those native tribes, and had confiscated and sold the waggon and cargo of a trader, whom they had proved to smuggle such articles to them. As it is not allowed by the Colonial Government to carry gunpowder and arms over the boundaries, without permission, and having one to that effect, we thought it the

best to show our permission to them, in order that they might see we were no smugglers. The consequence, however, was contrary to what we expected, and instead of satisfying them by this document, they were rather affronted with it, and persisted in declaring that no government could force them by an order to allow gunpowder to pass through their territory. We attempted to explain to them the real meaning of the permission; that it was intended only to show to the colonial public functionaries, that we might be allowed to pass unmolested over the boundaries; but they became the more insolent during this interview, and the close of it would probably have been a scuffle with bludgeons and horsewhips, were it not for the timely interference of our kind and friendly host, himself a wealthy and influential man amongst them, who rebuked them severely on their rude conduct towards us. This had the good effect of calming down their tempers. When they returned home that afternoon, we shook hands as good friends, and received the assurance that we might go wherever we liked, that nobody should hinder us on our way. Although many plants about the environs of this river were similar to those we had already observed along the country over which we had travelled since we had left the colony, yet it was interesting to meet with some species, here for the first time, differing from the rest of the Flora of that country. The *Menodora*, the *Pterodiscus*, and a fine species of a herbaceous *Erythrina*, (n. 531), are a few examples; they grow in a stiff loamy soil in the immediate neighbourhood of the river, as also *Cissampelos ?* (n. 9); *Sida Capensis*, (n. 101); *Hibiscus trionum ?* (n. 90); *Rhus ?* (n. 334); *Indigofera*, (n. 475); *Coniandra ?* (n. 600); *Othonna ?* (n. 995); *Tripteris ?* (n. 1008); *Teucrium Capense*, (n. 1351); *Achyranthes ?* (n. 435); a fine *Utricularia ?* (n. 1426), floating in pools of fresh rain water. Along the slopes of the hills joining the river, in rocky situations are fine species of *Kalanchœ*, (n. 671); *Ipomœa*, (n. 1221); *Convolvulus ?* (n. 1230); *Trichodesma*, (n. 1250); a fine species of *Blepharanthus ?*

(n. 1404), with a suffruticose stem and fine blue flowers; *Ruellia?* (n. 1413) growing out of the fissures of the rocks, with large ovate capitula; *Blepharis satureiæfolia*, (n. 1410); *Thumbergia Capensis?* (n. 1419); a very fine species of *Trichonema?* (n. 1604), with large purple flowers growing likewise between the fissures of the rocks; *Cyperus?* (n. 1748); *Chætaria*, (n. 1816); *Eragrostis?* (n. 1840).

Game was rather scarce in the immediate neighbourhood of the Great Vet River on account of the many emigrants, who had settled about here. We met here for the first time *Lamprotornis Burchellii*, Smith, a fine kind of starling, with a green and shining plumage, like that of *L. aurata*, but of a much larger size, and with a longer tail. The *Euplectis Tahe*, Smith, a small finch, inhabiting the ridges on moist places, and very swift on the wing, made likewise its first appearance here, as also a fine species of *Pterocles gutturalis*, Smith, together with the Namaqua partridge, *Pterocles Namaquana*, Tem.; they frequent the rivers generally in large coveys during day for the sake of the water.

The news of the early appearance of the horse distemper had induced the many emigrant farmers, who lived about here, to send their horses to an elevated tract at some days' distance, on a flat-topped Table Mountain, to keep them there till all danger was over. It is believed by the greater part of the farmers, that the luxuriant growth of the grass, after drenching rains, when it has been very dry before, will cause this distemper; and the same they believe will be effected by the dew in the morning, both assumptions, however, are scarcely credible. If these animals are sent in time before the disease has commenced below, to such elevated places, they are perfectly safe, provided the elevation is sufficient to occasion an equal temperature during day and night. If that object is realized, there is no farther danger: be it ever so dry, after heavy rains, the grass grows luxuriantly. All is safe when there is only an equal proportion with regard to temperature between day and night, which is always the case on those high regions, where the

air has a free circulation; provided they are not exposed to the influence of snow fields, of which there are none in these yet explored parts of South Africa. It is interesting during winter in many parts of the colony, in a frosty night, to ascend from a low country towards an elevated tract or mountain, where the change that takes place is obvious to every one; he feels himself transported within an hour or two, from a frosty winter night to a mild and pleasant climate. On account of this equality of temperature, flies and other insects live and enjoy themselves in those regions, as do the several kind of swallows, considered to be migratory birds, but which remain during winter where they find their food constantly. They are absent for some months in the country below, although the temperature is much higher during the middle of the day, but having frosty nights.

As it was necessary to wait till the period of the horse sickness was over, and as it was necessary for our purpose to get horses of a good quality, we thought it would be desirable to proceed to the mountainous country, to choose amongst many hundreds of these animals, such as would afterwards be worth our purchasing. We expected at the same time, to make comparatively better acquisitions on those mountain regions, belonging still to the high Witteberg Mountain chain, in Zoology and Botany. We passed the little Vet River soon after we had left the former; both are nearly of the same size, and join each other some miles further below where we forded it. Immediately after passing the little Vet River, we left the main road, leading towards the interior in a north westerly direction, and steered towards east to the distant mountain range, faintly perceptible from our position here. We passed several parties of emigrants, immediately we left that route, who had settled near the banks of a small river called "Laayspruit," a tributary of the little Vet River. Some marshy places in this valley were highly ornamented with *Gladiolus psittacinus* (n. 1624). Being just now in full blossom, they formed natural flower gardens in front of some houses of several of the farmers.

As they grow for the most part on an arable soil, destined by the emigrants for kitchen gardens, they must make room by and by for more useful culinary purposes. We entered into a trackless, but open wilderness, directly we had passed the little colony of the emigrants, being without trees or bushes, but covered with dense carpets of grasses. The country presented a vast undulated surface, as far as the eyes could reach, sparingly interspersed at remote distances, with rocky hills. This extended desert was seemingly only inhabited by thousands of game, and animals of prey, as we did not fall in with any human being, nor with any traces of a recent visit by them, we took up our quarters the first night near a periodical pool, filled with water during the rainy season. Many a bulb of the beautiful *Crinum roseum*, showed their long narrow leaves above the surface of the water. As they flower early in the spring, we were not so fortunate to see the ponds ornamented with those splendid flowers. The favourable opportunity amongst crowds of game, invited us to remain one day on that spot. On an excursion the next day towards a depressed tract, I started three lions out of the dry bed of a small periodical river, just as I was collecting specimens of *Crotalaria distans*, Benth., flowering on its immediate banks. They were much alarmed on seeing me standing nearly perpendicularly above their heads, as they had taken shelter in the shade beneath some steep rocks, against the effect of a burning sun, for no trees or shrubs could be seen here. Although the two females took flight, and soon disappeared; the male, which was a fine full-grown specimen of the black-maned variety, as soon as he recovered from the first impression of fear, and seeing no other opponent than me, walked off with great dignity, looking back over his shoulders at me at intervals, till he entered again the channel about a mile higher up. I went to the waggons, and returned with several of our party to the spot again, but we were disappointed, as he started again just as we were nearly within gun-shot of him, giving no chance to us of becoming proprietor of his long black-maned skin.

It was nearly night when we returned towards our camp, Punyer having shot a fine male specimen of the blessbock. After we had skinned him in the best manner during the dusk, we proceeded homewards, laden with trophies of our sport, but not without falling many times over large ant hills, or sinking into holes made by the ant-eaters, it being very dark.

A pair of kafir cranes, *Grus Pavonia,* the first we had seen during our journey, repeatedly pronounced their name, "*Mahem, Mahem,*" as they passed over our camp. These birds are so called by the Kossa Kaffirs in allusion to the sound they utter. It seems they usually resort to that pond during night, and were deprived of that convenience, since we encamped so near it. As we were leaving our station again the next morning, steering in the same easterly direction as the former day, we beheld before us, at a moderate distance, the mountain range, running in a north-easterly direction, but sloping down considerably. About a dozen wild dogs, (*Lycaon typicus,* Smith), an animal nearly the size of our European wolf, and of a similar slender form, was disturbed by our waggons among some sedges where they had concealed themselves, most likely after they had made an early breakfast. Their swiftness is astonishing when they are racing after antelopes; neither the fleet springbock, the hartebeest nor the blessbock escapes; they pursue, through thousands of other game, the one with which they have commenced the race, nor cease till it falls a victim. Ruppel's *Lycaon pictus* is found also in South Africa; though rare, I have seen several times small troops about the forests towards the eastern frontier. The striped hyæna, which is frequently met with towards northern Africa, is likewise uncommon in South Africa. I had only once an opportunity of getting a specimen during a night-hunt, with the assistance of a pack of faithful dogs, near the Bushman River.

Travelling over an undulated country, the depressed parts were often intersected with trenches, caused by heavy

rains often impeded our course, and formed strings of pools, in which we found the *Lagarosiphon muscoides*, Harv. (n. 1732); an aquatic plant, figured in "Hooker's London Journal of Botany." We collected both male and female flowering specimens of this curious little plant, the latter only bear their flowers on long peduncles, by means of which they reach the surface of the water. As the male flowers grow on short peduncles, enclosed in a common spatha, they remain constantly immersed. Many of them detached from the plant after their perfect envelopment, were floating on the surface amongst the female flowers, to fulfil their function, as in *Vallisneria*. A *Marsilea*, another aquatic plant, but without fructification, was likewise sparingly distributed amongst the former plants.

We arrived towards evening at the foot of a conical hill, being the extremity of a spur of that range, towards which we had bent our course during the last few days; and we took up our quarters here for the night. A few plants, just flowering and growing towards the flanks and top of that hill, were gathered; one, resembling a *Psoralea*, n. 449, with blue flowers, growing in shady, rocky places; as also a perennial *Composita*, n. 1041, the leaves somewhat similar to an *Achillæa*. Amongst grasses, in a sheltered situation, towards the top, I noticed the *Alepidea Amatymbica*, an umbelliferous plant, first discovered on the Winterberg chain, in the Tambuki country; a small *Thysantha*, and n. 645, a crassulaceous plant, growing in the shade, under some rocks, flowering likewise, were added to the collection. While shaping our course next day towards the nearest point of the main range of mountains, now only a short distance in front of us, we fell in with a well beaten road, opened but a few years ago, by the main bodies of the Dutch emigrants, on their march towards the Natal country. We pursued that road for a few hours, leading us in a north-easterly direction, till we came to some small parties of emigrants, who had made a temporary abode near a small periodical brook. A moderately high hill, in

the neighbourhood, was (a rare instance in an elevated country like this), densely clothed with the *Acacia Capensis*, Burch.; and wood being exceedingly scarce throughout the whole country, from the banks of the Orange River as far as the neighbourhood of the distant Macalis Mountains to the north, with the exception of a few thinly-wooded banks of rivers, the people had chosen this spot for the advantage thus offered them in the abundance of fuel and the materials for making cattle-folds and enclosures for their flocks of sheep, a matter of vast importance in a country like this, infested with numerous animals of prey, of the fiercest description.

As we were only a few miles distant from that Table Mountain, on which the greater body of horses of the emigrants had been kept during the horse-sickness, and we were obliged to remain here till the danger of that period was considered to be over, we were anxious to make the best use of our time. A line of detached mountains, at a short distance, being the north-eastern spurs of the Witteberge mountain chain, had gradually diminished in height and in grandeur during its course from the northern boundary of the Tambuki country, and seemed to promise a successful harvest of objects of natural history. In a few hours we reached the first range, and encamped in a grove of trees, chiefly composed of the *Acacia Capensis*, and amidst many ruins of deserted Betchuana villages, whose inhabitants had lived here peacefully and in wealth, perhaps from time immemorial, till their southern neighbours, of idle and plundering habits, proud in their superiority of fire-arms, preyed on the possessions and industry of that peaceful race; who finally were compelled, by the panic caused by the inroad of the Zooluh invaders in 1824, to abandon the soil of their ancestors and migrate to a spot safer, although less fertile than their former home.

As an instance of cruelty, which is still going on in these parts of the country, it may be worth mentioning a fact, which occurred at the time of our short stay here. A few families of that once opulent race were living only a few

miles distant from our camp, at the bottom of the same mountain, seemingly under an impression that they were sufficiently safe because residing near some emigrants. They chiefly depended on the produce of the soil, and supplied us frequently with vegetables, pumpkins, Indian corn, and milk; for they possessed a small number of cattle, which they had earned from the emigrants, for wages as herdsmen, or in exchange for vegetables. However, they were surprised one day by a party of marauders from the south, who were armed with guns. They took the few cattle from these defenceless creatures, and killed several men who attempted to defend their property. Some of our party met these villains, as they returned homewards from that roving expedition, riding on horseback, with their booty before them. We communicated what had occurred, to our neighbours the emigrants, who were very sorry to hear such distressing news, for they liked the Betchuana people, and declared they found them of great advantage, both from the supply of their vegetables and the service they rendered as trustful herdsmen. But in order to avoid any misrepresentation, they observed strict neutrality amongst these tribes, and declined to assist either party. However, they declared, should any party lay hold of the property, they would certainly teach them a lesson not to repeat it a second time. These villains find a ready market for plundered cattle near the colonial boundary, where traders frequently resort; and it being no easy task to distinguish an honest proprietor from a criminal, in a lawless country like this, they will carry on that horrible practice till fire-arms come into general use amongst those Betchuanas, to prevent the illegal practice of freebooting. There being already many individuals at the missionary stations who carry fire-arms, freebooting has diminished considerably of late years, and is chiefly practised upon small parties, living beyond the bounds of protection from the main body of their tribes.

As we had scarcely seen any of the *Acacia Capensis* since leaving the banks of the Orange river, the occurrence of

those trees was the less expected here at a more elevated spot, than their highest limits at the banks of the Orange River. From the shores of the Atlantic Ocean, the graceful tree in question is the chief ornament of the banks of that majestic river for many hundred miles, disappearing a few miles higher up than where we forded, an altitude of more than 4000 feet above the level of the sea. Comparing the elevation of our present station with the level of the Caledon river, where it runs between us and the Draka's mountain, in a line due south-east, the altitude of our present station cannot be less than 5000 feet. The appearance of that kind of tree, at an isolated spot of considerable elevation, is very remarkable, and we did not see a similar instance in this part of the country. The sheltered situation cannot be the cause, for there are many places offering the same advantage; nor can it be the nature of the soil that favours its growth. Whether this tree has been introduced many years ago by the natives who lived about this place, or what has been the original cause of its first transit to this isolated height, is difficult to conjecture.

The lofty range of the Witteberge mountains had changed its primitive character entirely, and instead of being a continuous barrier, as is the case from its first beginning for a considerable way, it consists here chiefly of detached hills, remarkable for their uniformity. The tops of most of them present a flattened table-like appearance, similar to many within the colony; and although their height is not considerable, the base on which they rest is already much elevated; for which reason, when standing on the tops of several of these hills, the view, east and south-east, seems unbounded, commanding a vast mountainous country, beyond which may be seen the far distant, alpine-like chain of mountains, dividing the Natal country and that of various Kaffir tribes, from the interior. Towards the west and north, the eye was only prevented from gazing further, by the scene gradually melting into the far-distant horizon.

The soil at the base of these hills, chiefly of a loamy nature,

mixed with decomposed particles of rocks, seemed very fertile. This was proved by the luxuriant growth of grasses along the hills, some species attaining a height of 4 or 5 feet, through which it was difficult to walk without following the footpaths of the natives, who live here in small parties scattered along the base of these hills, and depending chiefly or almost entirely on the produce of the soil. Although there was no scarcity of game in the neighbouring plains, the people had not the means of shooting it. We met them often on our excursions towards the precipices, on the tops of the hills, engaged in hunting the rock-rabbit and the rock-hare, which were plentiful, and which are driven out of their concealment amongst the fissures of rocks by little dogs, which enter those narrow places, when they are killed with clubs by the men. The rainy season, in this part of the country, was already over, vegetation was drying up rapidly, and the addition to our botanical collections, therefore, bore little comparison to the time we were obliged to spend here, and the many rambles we made in every direction through this part of the country. The only things of note we found in flower were a little *Indigofera*, n. 481, with a procumbent habit, on the edges of precipices on the rocks, exposed to the burning rays of the sun; in more shady places, sheltered by rocks, amongst a turf of grasses, grew the *Thysantha*, n. 645, *Tetraphyle*, n. 646, and *Petrogeton*, n. 650, all belonging to the Order *Crassulaceæ*. The *Alepidea Amatymbica*, *Galium Thunbergianum?* n. 771, *Lastrea*, n. 1863, at the same locality with the former. Along the flank of these hills, amongst large detached masses of rocks, together with some twining sorts of *Asparagus* and several kinds of *Rhus*, I observed the climbing *Helinus ovatus*, E. M. n. 317 (*Willemitia scandens*, E. and Z.), flowering, together with *Pilogyne*, n. 596, and forming a clustered mass, through which it was scarcely possible to proceed. I had a proof of this one day when returning homewards from an excursion late in the afternoon, over the plains of the table-topped hills. I had shot, about sunset, a wild dog (*Lycaon ypicus*), which I

desired to convey to our camp, but soon found it impracticable, on account of the great masses of rocks and the climbing shrubs along the slope down to the plain. Being obliged to take the skin off the animal, in order to carry it, darkness had set in ere I had finished the task, and not feeling inclined to stop all night at an unsafe spot like this, I sought the best mode of descending to the plain. On hands and knees I scrambled downwards, through clustered thickets and over rocks, but with the sacrifice of jacket and trousers, and receiving many scratches on my unprotected skin.

Trees of *Rhamnus celtifolia* grow occasionally amongst the chaotic deposits of broken rocks, a conglomerate of pebbles and lime, detached from the strata of rocks, forming the top of these hills. These trees seldom exceed 25 or 30 feet, and seeming to require protection, their wood being very fragile, they find shelter between the spaces of these high blocks of rocks. The *Heteromorpha trifoliata*, and *Fusanus compressus*, likewise occupy here the same places as the former tree. Along the slope of these hills we noticed also, in a loamy soil, a fine little shrub, with large lilac flowers, much resembling *Barleria obtusa*, N. ab Esenb. n. 1415, and another creeping *Acanthacea*, n. 1409, with a habit different from those species which grow near the southern sea-shores; the *Blepharacanthus procumbens*, N. ab E., a repent *Hermannia*, n. 103, with large rugose leaves, and *Dicoma*, n. 1028, a prostrate plant, belonging to *Compositæ*, growing amongst the grass on the plains, were added to the few plants collected here in flower.

It is in this range of detached mountains that the several tributaries of the Gariep, or Vaal River, begin; as the Vet River, the Sand River, Fals River, and the Rhinoster River, running nearly at equal distances in an easterly direction, over boundless plains of meadows, of luxuriant growth.

Having now reached about the 28° 20′ of eastern longitude, and 28° 10′ south latitude, we found with much satisfaction, that the emigrants considered the unhealthy season over, and the destructive distemper of the horses also, for

they brought these animals down from the Table Mountain, on which they had been kept during that fearful time. Having purchased several, of a suitable quality, we proceeded, about the latter end of April, towards the interior. The general appearance of the country and the character of vegetation nearly resembling those tracts over which we had travelled since we left the Caledon River, very little of interest could be added to the collection, especially in botany; it was also winter, and the dry season, when vegetation is almost paralyzed. In every direction rose clouds of smoke, caused by the custom which the natives have of firing the dry grass. This they do, partly to encourage a new growth in the following summer, but principally because they thus ensure an easy course over the plains, and also dislodge and exterminate numerous reptiles and beasts of prey, lions and others, which harbor among the luxuriant remains of vegetation. As the *Ruminants* living in these tracts, however numerous, can only consume a part of the rich pasturage, the practice of burning the dried vegetation, which is adopted by all the sub-tribes of the Betchuana nation, so far as we have been amongst them, to the remote distance near to the tropics of Capricorn, may have also a beneficial effect on the health of the people living in those parts, where the putrid matter of a rich vegetation, during the hot and moist season, would undoubtedly generate miasma destructive to man, as is the case along the east coast, about Delagoa Bay, &c. Sometimes, however, the aborigines are saved this trouble by myriads of locusts, which eat up every thing, scarcely leaving a blade in the tract over which they pass; and as these insects seem to please the native palate, great quantities are collected during the time of their appearance, and turned to a useful purpose as food.

(*To be continued.*)

Notes on the Botany of the Pyrenees, in a letter to the Editor, from RICHARD SPRUCE, ESQ.

(*Continued from p.* 142.)

I proceeded up the Vallée d'Ossau as far as Louvie, by the Eaux-Bonnes' diligence, and from thence walked the remaining ten miles to Laruns, a little town, about half-way between the Eaux-Bonnes and the Eaux-Chaudes, where I had decided on taking up my quarters, with a view to avoiding the crowd of fashionables at these two watering-places. A little before arriving at Louvie begin the first range of the Pyrenees and the forests of box-trees which form so striking a feature in those mountains. In my walk up the valley, I gathered *Leskea attenuata*, *Hypnum abietinum* and *rugulosum*, three mosses which are almost constantly found in company, *Barbula vinealis*, *Orthotrichum stramineum*, &c., besides *Heracleum Pyrenacium*, the pretty *Melica ciliata*, and a few other plants.

The little hamlet of Bagès (commune of Béost), which stands on the hill-side to the left of Laruns, is the residence of Pierre Gaston-Sacaze, the celebrated shepherd-botanist. I had letters to him from Mr. Bentham and Dr. Dufour, and the following morning I walked up to deliver them. As I approached the house, I recognised on the neighbouring walls, and especially in the little garden through which I passed, several alpines, which had been transported thither by the hand of Gaston. There was the *Lithospermum Gastoni* (*his own plant*, as he proudly called it), a new *Erodium*, lately distinguished by Dr. Bubagni, and named after its finder, M. Manescau, the present Mayor of Pau, *Erodium Manescavi*; several *Saxifrages*, *Sedums*, &c. Gaston himself is a fine specimen of the peasantry of the Vallée d'Ossau; tall, not handsome, but with thoughtful, intelligent features. His story is well known, even in England, from the interesting account given of him by Mrs. Ellis in her book on the Pyrenees. The little I have to add has been gleaned from

my conversation with him. His first knowledge of plants was obtained from a work which fell into his hands containing descriptions of 200 species, useful as remedies for diseases of cattle. He made himself acquainted with all of these within his reach, and turned his knowledge to practical account in administering to his own flocks and herds as well as to those of his neighbours, by which he acquired considerable reputation as a veterinarian. But he was soon not satisfied with this extent of knowledge and the thought was continually recurring to his mind, " I see around me hundreds of plants, which, if they do not possess the same sanative or deleterious properties as the others, are at least equally beautiful; why not study them also?" He at length determined to gratify his curiosity, and procured a copy of the Species Plantarum, of Linnæus; this, however, he found to be written in Latin, a language of which he knew not one word. Still, he was not discouraged; and happening to visit Pau, he found there a Latin dictionary on a bookseller's stall, which he purchased for the sum of nine sous! With no other aid than this, he set to work to teach himself Latin, and soon acquired a sufficient acquaintance with it to enable him to read Linnæus. He has now been for twenty years engaged in the study of botany, his researches being confined entirely to his own valley, in which he enumerates 1800 species of flowering plants. To his botanical pursuits he has superadded those of entomology, geology, meteorology, painting, &c.; but this diffusion of study is much to be regretted, as it effectually prevents him from becoming *savant* in any one subject, and I could hardly style him with the amiable Desmoulins, " Cet homme de génie qui, comme les bergers Chaldéens se firent astronomes, s'est fait seul, en gardant ses brebis, botaniste, peintre, musicien!" During the season of the " Eaux," his time is entirely taken up by visitors from the Eaux-Bonnes and Eaux-Chaudes, where he is looked on as a *lion* which no one should go away without seeing. This also is injurious to him in preventing the severe daily application which is absolutely necessary to render any one skilful, and

in tending to confine his attention to the showy and superficial, to the exclusion of the solid, in the objects of his pursuit. I must in justice add, that he appears perfectly amiable and kind-hearted, and that his moral character is such as to command universal respect.

After a glance at Gaston's herbarium, we set out, at his recommendation to ascend the low mountain (la Montagne Verte) which lies between Bagès and Les Eaux-Bonnes. In ascending we gathered fine specimens of *Arnica montana*, *Vicia Orobus*, DC., *Cardamine latifolia*, *Cochlearia saxatilis* var. *auriculata*, *Orthotrichum Hutchinsiæ* and *Ludwigii*; and the summit was carpetted with *Genista pilosa* and the pretty *Trifolium alpinum*, the long woody root of which is chewed by the shepherds of the Pyrenees under the name of *réglisse* (liquorice). In descending by a different route, I gathered *Mastigobryum deflexum*, *Lecidea ventosa*, *Biatora rivulosa*, &c.

My most interesting herborisation in this neighbourhood was made on the Pic de Ger, a mountain of about 8000 feet in height, which overlooks the Eaux-Bonnes. I ascended it, as far as practicable for the snow, on Monday the 30th of June, in company with Pierre Gaston. We had arranged to make the attempt two days previously, but the morning looked cloudy and threatening, and Gaston was wise enough to stay at home; for myself, I went as far as the Eaux-Bonnes; and, except gathering *Euphorbia verrucosa* and *Alchemilla alpina*, all I got for my pains was a thorough soaking. I was besieged by a party of guides in the street of the Eaux-Bonnes, who would fain have persuaded me to engage the services of one of them to ascend the mountain, telling me that there was only "un peu de brouillard" which would shortly pass away, although it was at the time raining nearly as fast as it could pour. On the Monday, the weather was everything that could be desired, with the exception of a burning sun which rendered the ascent very toilsome, especially to me, for I was not then so inured to climbing as I afterwards became. We followed a steep track made by the charcoal burners and shepherds, along

a gorge called "la Coume," where we were mostly up to the neck in box-bushes. It was too dry and exposed to produce any Cryptogamia, and it was only after nearly two hours' walking, when we reached the region of pines and the first snow, that I began to fill my vasculum. Here the south side of a ravine was strewed with decaying pine-trunks, brought down by the avalanches and melting snows of former years, and on them I reaped a rich harvest, especially of *Hepaticæ*. I recognised on the spot, *Jungermannia curvifolia, Bantriensis, connivens, asplenioides,* and some others, all in fructification; but I was most pleased to gather fine fruit of *Jung. exsecta,* which has, I believe, never been seen in England. Some trunks were nearly covered with *Hypnum Silesiacum,* bearing fruit profusely, and I found along with it *Buxbaumia indusiata,* but very scarce. On stones in the same place, were fruited *Hypnum Halleri* and *Lejeunia calcarea.* My companion, not seeing much to interest him in the mosses I was collecting, strayed so far ahead of me that when I looked round for him he was out of sight and hearing, and though we sought each other for four hours, we met no more until we reached the foot of the mountain. I continued my upward progress in the direction I supposed he had taken and soon emerged on a plateau, called Las Tosses (*les pacages*) de Gesque, where in summer a few flocks find pasturage. In crossing this, I came upon large patches of ground entirely covered with *Gentiana acaulis* and *verna,* and *Horminum Pyrenaicum.* On attaining the rocks called Pambécibé, at about three-fourths the whole height of the mountain, where Dufour had indicated to me several Lichens, I found them covered with snow, and perceived that all further ascent would be useless. I gathered several interesting plants in the vicinity of the melting snow, such as *Androsace villosa, Ranunculus Pyrenæus, Viola biflora, Primula integrifolia,* and *Silene acaulis.* The other plants on the Pic de Ger, were *Ranunculus Gouani, montanus* and *Thora, Geum Pyrenaicum, Dryas octopetala, Silene quadrifida, Hutchinsia alpina, Dentaria pinnata* and *Aspidium Lonchitis.*

Gaston, who had gone more to the left and mounted somewhat higher, brought me down *Thalictrum macrocarpum*, Grénier; *Saxifraga aretioides*, Lapeyr.; *Veronica aphylla*, *Sedum atratum* and a few other things. I must not omit to state that I gathered *Saxifraga umbrosa*, *hirsuta*, and *Geum* growing together, and I wish I could say not passing into each other. I feel satisfied, however, that if we will have two species, we must, to be consistent, admit three, the three above-named, which are admirably though briefly characterised in the second edition of Koch's Synopsis. I have seen few *Saxifrageæ* in the Pyrenees which might not safely be referred to one or the other of these, yet there are some which appear exactly intermediate: between S. *umbrosa* and *hirsuta*, for example, I have observed a state possessing an expanded and cuneate petiole as in the former, and yet hairy in the entire upper surface, and another with leaves oblong-rotundate, tapering suddenly into the petiole (as in S. *hirsuta*) and yet the latter merely ciliate at the margins. As to the cuttings of the edges of the leaves, all the three vary from crenate to inciso-serrate.

My shorter excursions around Laruns did not yield me much. The gorge of the Eaux-Chaudes, though not surpassed in magnificence by any in the whole range, is very barren of *Cryptogamia*, as are indeed most of the transversal valleys of the Pyrenees; while the valleys parallel to the central ridge are on the contrary usually very rich. It was in this gorge I saw *Tortula paludosa* for the first time, but the capsules were old and without peristome, and it was not until the end of autumn, when I found it in good state in a different locality, that I recognised it. In the axils of the uppermost leaves of the barren plants, I observe almost constantly certain roundish bodies, resembling the gemmæ of *Bryum annotinum*, and supported like them on a short pellucid jointed stalk, but composed of much smaller granules. I added also to my collection, *Arabis alpina*, *Dianthus Monspessulanus*, *Helianthemum canum*, *Trifolium montanum*, *Teucrium Pyrenaicum*, *Globularia nana* and *medi-*

caulis, Carex sempervirens, Cephalogonium longipilum, B. et S. and several rock Lichens.

My next destination, on quitting Laruns, was Cauteret, in the Hautes Pyrénées; but I found it necessary to descend the Vallée d'Ossau to Pau, where I intended leaving my collections, and I had occupation for three or four days in drying and putting them away. On the 8th of July, I left Pau by the Cauteret diligence, intending to proceed as far as Argélez, where I had appointed to meet a botanical friend and countryman (Dr. S.) whose acquaintance I had formed at Pau, and in whose company I afterwards made most of my long excursions. Great part of the following day was devoted to an exploration of the environs of Pierrefitte, a village situated on the south side of the valley or plain of Argélez, at the junction of the Gaves de Pau and de Marcadaou, which descend respectively the gorges de Luz and de Cauteret. Here we gathered *Hypericum Richeri*, the endlessly varying *Scrophularia Scopolii, Sedum sphæricum*, Lapeyr.; S. *hirsutum* and *atratum, Aira Valesiaca*, a *Melica* which is either a most remarkable variety of M. *ciliata* or an undescribed species,* besides some interesting-looking *Brya* and other *Cryptogamia.*

RICHARD SPRUCE.

(*To be continued.*)

* I add the following description from my notes.—Plant larger and stouter than *M. ciliata.* Culm and sheaths more strongly striate; the former leafy throughout, *the uppermost leaf always reaching above the base of the panicle* and sometimes attaining its summit (while in *M. ciliata* the culm is leafless in its upper third). *Leaves much longer and plane* (not involute). Panicle spiciform, compound (in *M. ciliata* simple). Spicula lanceolate, narrower than in *M. ciliata,* usually enclosing two fertile flowers. Upper calyx-valve half as long again as the lower (while in *M. ciliata* the two are nearly equal), both pale on the back and less strongly nerved than in *M. ciliata*, which has the valves purple towards the base, especially on the nerves. Lower palea of the lower fertile flower densely ciliato-villose *on a line parallel to and near the margin* from the

Contributions towards a Flora of South America. *Enumeration of Plants collected by* Sir Robert Schomburgk, *in British Guiana.—By* George Bentham, Esq.

(*Continued from* Vol. IV. *p.* 674.)

Convolvulaceæ.

881. Maripa *densiflora*, sp. n., caule scandente glabro, foliis ovato-v. oblongo-ellipticis acuminatis glabris, paniculæ terminalis glabræ pedunculis brevibus confertim multifloris, bracteis minutis, sepalis exterioribus glabris interioribus extus basi sericeis, corolla sericeo-villosa.—On the Rio Padawire, *Schomburgk*.

Caulis lignosus, alte scandens, ramulis sæpe volubilibus. Folia coriacea, nitida, 4-6-pollicaria, iis M. *scandentis* iconis Aubletii simillima. Panicula subpedalis, pyramidata, basi foliata, subflexuosa, glabra. Pedunculi seu rami inferiores bipollicares, folio subtensi, superiores multo breviores aphylli. Cymæ confertæ, 10-15-floræ. Bracteæ et bracteolæ squamæformes, brevissimæ v. obsoletæ. Pedicelli calyce multo breviores. Calyces subglobosi, 3 lin. longi; sepala orbiculata, concava, in sicco ferruginea, margine membranacea, lævia et brevissime ciliata, dorso exteriora punctato-corrugata, interiora pilis longiusculis appressis sericea. Corollæ nondum apertæ in alabastro extus villosissimæ, tubo tamen ut in M. *scandente* glabro, intus glabræ. Antheræ M. *scandentis* et filamenta pariter basi dilatata et ibidem glanduloso-pilosula,

base to very near the summit, the cilia equalling or overtopping the longer calyx-valve (but shorter than it in *M. ciliata*).

I may remark that the cilia are affixed to the paleæ in *M. ciliata* precisely as in my Pierrefitte plant, which I have ascertained by an examination both of authentic specimens in Mr. Webb's herbarium at Paris, and of my own, although Koch describes them as *arising from the very margin itself*; but the portion intervening between the line of hairs and the true margin is inflexed and so diaphanous, that unless the palea be flattened out and the hairs turned aside under the microscope, it is almost certain to escape observation.

cæterum filiformia, glabra. Ovarium basi glabrum, apice villosissimum (in M. *scandente* pilis paucis apice coronatum), carnosulum, complete biloculare. Ovula 4, adscendentia. Stylus filiformis, apice coronatum stigmate crasso late orbiculato obscure bilobo.

The climbing stem distinguishes this species from M. *erecta* and M. *glabra*, the smooth leaves from M. *spectabilis*. In habit and leaves it comes nearest to M. *scandens*; but the dense inflorescence, smooth outer sepals, and scarcely visible bracts, sufficiently distinguish it.

882. M. *scandens*, Aubl. Pl. Guian. 1, p. 230, t. 91, vix Chois.; caule scandente glabro, foliis ovato-ellipticis breviter acuminatis glabris, paniculæ terminalis pubescentis pedunculis laxe cymiferis, bracteis bracteolisque ovatis squamæformibus, sepalis sericeo-pubescentibus cinereis, corolla sericeo-villosa.—British Guiana, *Schomburgk*, 2nd Coll. n. 110 (46). Also Surinam, *Hostmann*, n. 1251.

This agrees with Aublet's description and figure in every thing except the size of the corolla, which is near 1½ inch long, and not so deeply divided as is represented by Aublet; but his drawing has every appearance of being made from an unexpanded bud, as the branch he figures has none but young buds. Choisy's character differs from all specimens I have seen, as well as from Aublet's description and figure, especially in the cordate leaves.

883. M. sp. n.?—Different from either of the above; but my specimen is insufficient for description.—British Guiana, *Richard Schomburgk*, n. (1469).

884. Quamoclit *coccinea*, Mœnch.—Chois. in DC. Prod. 9, p. 335.—British Guiana, *Schomburgk*, n. 511 (782).

885. Batatas *paniculata*, Chois. in DC. Prod. 9 p. 339.—B. *edulis* γ *platanifolia*, Chois. l. c. from Schomburgk's number quoted. My specimens have all, however, the leaves, calyx and corolla of B. *paniculata*, and are in every respect at variance with the cut-leaved varieties of B. *edulis*.—Waste places and sides of rivers near Pirara, *Schomburgk*, n. 701.

886. B. *glabra*.—*Convolvulus glaber*, Aubl. Pl. Guian. 1,

p. 138, t. 53.—*Ipomæa glabra,* Chois. in DC. Prod. 9, p. 362.—Ovarium complete quadriloculare. Sepala per fructus maturationem aucta, subscariosa, stellato-patentia, obtusa v. acutiuscula, interiora interdum fere pollicaria. Capsula glaberrima, depressa, quadrilocularis, styli basi indurato coronata. Semina nigra, minute puberula.—British Guiana, *Schomburgk ;* also Surinam, *Hostmann,* n. 45 ; Brazil, *Sello,* &c.

887. B. *cissoides,* Chois. in DC. Prod. 9, p. 339.—British Guiana, *Schomburgk,* 1st Coll. n. 242 and 736, 2nd Coll. n. 16 and 98 (19).

888. B. sp. n. affinis B. *quinquefoliæ,* glabra, foliis pectinatim profunde 7-lobis, lobis linearibus mucronatis, sepalis oblongis aristatis. Corolla ignota. Capsula quadrilocularis.—Evidently a very distinct species, but the single specimen from Schomburgk's first collection is not sufficient to characterize it satisfactorily.

889. Pharbitis *Nil,* Chois. in DC. Prod. 9, p. 343.—On the falls of the Rio Branco, *Schomburgk.* French Guiana, *Leprieur, Herb. Par.* n. 135.

890. Ipomæa *aturensis,* Don.—Chois. in DC. Prod. 9, p. 367.—I. *juncea,* Chois. in DC. Prod. 9, p. 355. I cannot see any character by which these two plants are to be distinguished. It is true that Choisy places the I. *aturensis* in his section *Strophipomæa,* but it is evident from Kunth's description, that the stem is not voluble.—Schomburgk's plant appears to be sometimes erect, sometimes spreading.—Gravelly savannahs, on the Rupunoony, *Schomburgk,* 1st Coll. n. 625 ; also in the Brazilian province of Goyaz, *Gardner,* n. 3354.

891. I. *Schomburgkii,* Chois. in DC. Prod. 9, p. 354.—British Guiana, *Schomburgk,* n. 692.

892. I. *guianensis,* Chois. in DC. Prod. 9, p. 366.—Flowers white.—British Guiana, *Schomburgk,* 1st Coll. n. 708, 2nd Coll. n. 101 (35); French Guiana, *Leprieur, Herb. Par.* n. 133.

893. I. *tamnifolia,* Linn.—Chois. in DC. Prod. 9, p. 365.

—Flowers blue.—British Guiana, *Schomburgk*, 1st Coll. n. 171; 2nd Coll. n. 119 (58).

894. I. *umbellata*, Mey.—Chois. in DC. Prod. 9, p. 377.—In dried specimens this species is often not distinguishable from the Asiatic I. *cymosa*, for which I had mistaken it in the Botany of the Voyage of the Sulphur; but it appears that it has always yellow flowers, not white as in I. *cymosa*, and the leaves are usually, though not always, more deeply cordate or sagittate at the base.

895. I. *evolvuloides*, Moric.—Chois. in DC. Prod. 9, p. 373.—Flowers blue.—British Guiana, *Schomburgk*, 2nd Coll. n. 505 (797).

There is also a slender variety, from Roraima, with much longer petioles and long points to the leaves, perhaps a distinct species, but the specimen is insufficient. Both forms come very near to the genus *Jacquemontia*.

896. Jacquemontia *hirsuta*, Chois. in DC. Prod. 9, p. 397.—British Guiana, *Schomburgk*, 2nd Coll. n. 370 (654).

897. Aniseia *ensifolia β minor*, Chois. in DC. Prod. 9, 430.—Flowers white.—Moist Savannahs, British Guiana, *Schomburgk*, 1st Coll. n. 776.

898. Evolvulus *strictus*, sp. n., caule rigido elongato longe sericeo-piloso, foliis dissitis anguste oblongo-lanceolatis utrinque molliter appresse pilosis, floribus in axillis superioribus sessilibus supremis in spicam approximatis, sepalis lanceolato-subulatis hirsutis corolla dimidio brevioribus capsula duplo longioribus.—Dry savannahs, near Roraima, *Schomburgk*, 1st Coll. n. 1036.

Caulis adest sesquipedalis, strictus, superne ramulis aliquot brevibus auctus. Pili caulis et foliorum paginæ inferioris candicantes, foliorum superiorum et inflorescentiæ ferruginei. Folia inferiora pollice paullo longiora, 2-3 lin. lata, acuta v. obtusiuscula, basi angustata. Folia floralia caulinis minora sed consimilia, inferiora 5 lin. longa, suprema calycibus subbreviora. Inflorescentia spicam format foliosam, superne densam, basi interruptam, in specimine 5 pollicarem.

Calyces $3\frac{1}{2}$ lin. longi. Corolla alba, 7 lin. longa, in specimine meo cum genitalibus a vermibus fere destructa. Capsula globosa.

899. E. *glomeratus*, Nees et Mart.—Chois. in DC. Prod. 9, p. 442.—British Guiana, *Schomburgk*, 1st Coll.; also 2nd Coll. n. 296 (557).—Piauhy in Brazil, *Gardner*, n. 2255, 2257.

900. E. *sericeus*, Sw.—Chois. in DC. Prod. 9, p. 443.—Dry savannahs, British Guiana, *Schomburgk*, 1st Coll. n. 623, 2nd Coll. n. 338 (526),

901. E. *alsinoides*, Linn.—Chois. in DC. Prod. 9, p. 447.—S. Isabel, on the Rio Negro, *Schomburgk*, 1st Coll. n. 1012.

902. E. *linifolius*, Linn.—Chois. in DC. Prod. 9, p. 449.—British Guiana, *Schomburgk*, 2nd Coll. n. 483 (741).

903. Dicranostyles *scandens*, gen. nov.—Camanow, in British Guiana, *Schomburgk*, 1st Coll. n. 1010.

Char. gen.—Calyx 5-fidus, lobis imbricatis. Corollæ tubus brevis, limbus patens, 5-partitus, segmentis æstivatione valvato-induplicatis. Stamina tubo inserta. Antheræ versatiles, loculis contiguis, connectivo subnullo. Ovarium (incomplete?) biloculare, ovulis in loculis geminis adscendentibus. Stylus apice bifidus, lobis apice capitato-stigmatosis.

D. *scandens*. Frutex alte scandens, habitu *Lysiostyli* mox descripturo affinis. Ramuli juniores, petioli et inflorescentia tomento tenuissimo cinerascentes. Folia alterna petiolata, 3-4-pollicaria, oblonga, longe et abrupte acuminata, basi cuneata et breviter complicata, coriacea utrinque glabra, supra nitidula, subtus pallida, costa media prominula, venis tenuibus. Paniculæ axillares, racemiformes, 1-2-pollicares, cymis subtrifloris fere sessilibus. Bracteæ parvæ, squamæformes, acutæ. Pedicelli brevissimi. Calyx tomentellus, vix lineam longus, laciniis orbiculatis obtusis. Corollæ tubus glaber, calycem æquans, apice in faucem expansus, limbi laciniæ fere 2 lin. longæ, extus adpresse pubescentes, apice acutiusculæ, leviter inflexæ, non mucronatæ. Stamina medio tubo inserta; filamenta inferne dilatata, glanduloso-hirtella,

superne filiformia, libera, corollam æquantia. Antheræ breviter oblongæ. Stylus glaber, filiformis, corollam æquans, lobis brevibus filiformibus.

904. Lysiostyles *scandens*, gen. nov.—Maboodahu, British Guiana, *Schomburgk*, 1st Coll. n. 491.—var. latifolia.—British Guiana, *Schomburgk*, 2nd Coll. n. 763 (1532).

Char. gen.—Calyx 5-fidus, lobis imbricatis. Corollæ tubus brevis, limbus rotatus 5-partitus, segmentis æstivatione valvato-induplicatis. Stamina ad faucem inserta. Antherarum loculi paralleli discreti, ad basin connectivi crassi adnati. Ovarium 1-loculare. Ovula 4, erecta. Styli 2, usque ad basin distincti, apice capitato-stigmatosi.

L. *scandens*. Caulis lignosus super arbores altissimos scandens. Ramuli novelli uti petioli et pedunculi pube rubiginosa vestiti, annotini glabri. Folia alterna, petiolata, 3-5-pollicaria, oblonga, breviter acuminata, basi obtusa, coriacea, supra fere glabra, sed tactu scabriuscula et interdum ad venas pilosula, subtus rubiginoso-tomentella. Costa media et venæ primariæ utrinsecus 6-7 subtus valde prominentes, supra impressæ; rete venarum nonnisi in pagina inferiore conspicuum. Paniculæ axillares, solitariæ v. geminæ, 1-2-pollicares, simplices, ramulis brevibus alternis cymoso-3-5-floris. Bracteæ minutæ squamæformes v. nullæ. Pedicelli linea breviores. Calyx lineam longus, rubiginoso-tomentellus, ultra medium divisus in lobos orbiculares obtusos subæquales. Corollæ albæ tubus vix calycem æquans, laciniæ 1½ lin. longæ, triangulares, acutæ, mucrone longo piliformi terminatæ, extus villosæ intus glabræ. Stamina corolla breviora, glabra. Filamenta basi incrassata, faucem corollæ fere claudentia, dein filiformia. Connectivum oblongum, obtusum, crasso-compressum, basi utrinque loculum ferens connectivo ipso dimidio breviorem. Ovarium sessile, depresso-globosum, apice villosissimum. Dissepimenti incompleti rudimentum tenue. Ovula 4 e centro ovaria adscendentia. Styli breves, glabri.

The above two genera are so closely allied to each other in habit, inflorescence, calyx and corolla, that I should not have hesitated in uniting them, could that have been done

without breaking through the only fixed characters by which convolvulaceous genera have as yet been distinguished. They are allied, on the one hand, to *Maripa*, on the other to *Erycibe*, but abundantly distinct from both. The latter genus has been raised by A. De Candolle to the rank of a distinct natural order, but its connection with the true *Convolvulaceæ* appears to me far too close to justify the separation. De Candolle relies chiefly upon three grounds: the æstivation, the quinary stigmate, and the entirely unilocular ovarium. The first, the æstivation, is in *Erycibe* as in the two new genera now proposed, induplicate-valvate, whilst in ordinary *Convolvulaceæ* it is plicate; but the only difference between the two is, that in the former case the lobes are divided to the bottom of the folds, whilst in the latter, the folds extend below the divisions; a distinction of very little importance. The apparently quinary stigma does not appear on a careful examination of several *Erycibes*, to be organic, but the 5 or 10 oblique ribs and furrows in that genus, as in *Maripa*, (as described by E. F. W. Meyer,) are probably merely the impressions made on the stigma in the bud by the quinary external parts of the flower, the stigma being, in fact divisible into two lobes, as in most other *Convolvulaceæ;* the shortness of the style is but a character of degree, and may be observed in *Cuscuta*. The third distinction, the unilocular ovarium, is again of very little importance in *Convolvulaceæ*, where the dissepiments are often very incomplete, and always independent of the position and insertion of the ovules.

GESNERIACEÆ.

Since the publication of the 7th volume of De Candolle's Prodromus, the number of *Gesneriaceæ* known has nearly doubled, the forms assumed by the flower and fruit have been found to be much more varied than was supposed, the characters assigned to the genera are no longer sufficient to distinguish them clearly, either from one another, or from the new ones since proposed, and the characters assigned to

the order itself for its separation from *Cyrtandraceæ* have been entirely broken down by Mr. Brown, so that there is now scarcely any order which is more in want of a complete revision. My materials do not suffice for undertaking the task on the present occasion; but as I have found it necessary to add several genera, either here or in the *Plantæ Hartwegianæ*, to those already described, an enumeration of the American genera hitherto known may not be out of place.

Tribe 1. GESNERIEÆ.—Calyx ovario plus minus adnatus.

* *Calyx nudus, ovario toto adnatus.*

Calycis limbus 5-partitus.—*Rytidophyllum* and *Conradia*, which require considerable revision as to their respective limitation and distinction, and probably the separation of some species.

Calycis limbus tubulosus, semi-5-fidus.—*Solenophora.*

** *Calyx nudus. Ovarium apice liberum, conicum v. ovatum.*

To this group belong four genera, *Gesneria*, *Gloxinia*, *Achimenes* and *Diastema*, all numerous in species, the greater number of which may be distributed among the four by the following characters.

Gesneria. Corolla (coccinea aurantiaca v. rarius alba) basi subæqualis, tubulosa v. tubuloso-campanulata; limbo nunc (Sect. *Corytholoma*) bilabiato, labio superiore erecto, inferiore trilobo patente, nunc (Sect. *Isoloma*) 5-partito, lobis brevibus latis subæqualibus. Glandulæ 3 v. 5.

Gloxinia. Corolla (cœrulea violacea albido-rosea v. straminea) basi postice gibba, ample tubuloso-campanulata, limbo 5-lobo erecto-patente. Glandulæ 3 v. 5.

Achimenes. Corolla (versicolor) basi postice gibba v. calcarata, (rarius subæqualis?) tubo declinato superne ampliato, limbo plano-patente 5-fido. Annulus hypogynus integer.

*Diastema.** Corolla basi æqualis v. postice gibba, tubo

* This is the genus to which Pœppig and Endlicher have given the name of *Trevirana*, on the supposition that it would include the *Cyrilla pulchella*,

declinato vix ampliato, limbo plano-patente 5-fido. Glandulæ 5 lineares.

The two last genera have moreover the anthers generally free, or less coherent than in the two former, and the stigmatic apex of the style more evidently divided, and *Diastema* has an inflorescence peculiar to itself.

There are, however, anomalous species which more or less break through the distinctive characters, especially of the three first genera. Such are *Gesneria prasina*, or De Candolle's section *Prasanthea*, probably a distinct genus; *Gloxinia tubiflora* with the corolla of an *Achimenes*; *Achimenes multiflora* with the corolla of a *Gloxinia*, *Achimenes argyrostigma* with the upper lip of the corolla erect, &c.

*** *Calyx involucro diphyllo inclusus.*

The very distinct genus *Mitraria* is the only one known of this group.

Tribe 2. BESLERIEÆ. Ovarium liberum. Semina albuminosa.

* *Bacca indehiscens.*

Calyx 5-partitus. Corolla tubulosa v. tubuloso-campanulata, incurva, fauce valde obliqua, lobis lateralibus cum supremis alte adnatis incurvis, infimo patente. Filamenta basi connata.—*Columneæ veræ.*

Calyx 5-partitus. Corolla ventricoso-tubulosa, fauce vix obliqua, labio superiore erecto inferiore patente trilobo. Filamenta basi leviter connata.—*Columneæ* sectio v. genus *Ortholoma*, Benth. Pl. Hartw.

Calyx 5-partitus. Corolla ventricoso-tubulosa, limbo subæqualiter 3-dentato v. 5-partito.—*Hypocyrta.*

Calyx 5-fidus v. vix 5-partitus. Corolla tubulosa v. subcampanulata, limbo subbilabiato brevi. Filamenta libera. Bacca pericarpio tenui vix succosa.—*Besleria.**

Lhér., or *Trevirana coccinea*, Willd.; that species, however, is a true *Achimenes*, with annular disc, and without the linear glands, or the inflorescence of *Diastema*.

* De Candolle's doubtful *Beslerias*, which do not answer to the above character, form probably distinct genera, but are for the most part insufficiently known.

** *Capsula bivalvis, carnosa v. coriacea.*

To this group belong *Drymonia, Alloplectus, Nematanthus, Centrosolenia, Tapina,* and perhaps, *Sarmienta*. Among these, *Drymonia* and *Tapina* are not well known to me; *Alloplectus* is distinguished by the large coloured divisions of the calyx, and the contracted mouth of the corolla with a spreading equal limb; *Nematanthus* by the tubular or tubular-campanulate corolla gradually enlarged at the top; *Centrosolenia* by the tubular corolla with a spur at the base; *Sarmienta* by the abortion of two of the stamina.

*** *Capsula membranacea.*

Under this head must certainly be comprised *Cremosperma*, (Benth. Pl. Hartw.), with a tubular 5-fid calyx, and a corolla like that of *Diastema*; and probably also *Gasteranthus* and *Niphœa*, both distinguished by the singular forms of the corolla, but of which the ripe fruit is unknown to me.

Tribe 3. CYRTANDREÆ. Ovarium liberum. Albumen tenuissimum v. nullum.

Although formerly considered as confined to the Old World, this tribe has now been found to contain, besides the *Klugia* of Schlechtendal, referred by Brown to the E. Indian genus *Glossanthus*, three purely American genera, viz:

Episcia, calyce 5-partito.

Tussacia, calyce laxe campanulato, breviter et late 5-fido, lobis dentatis.

Napeanthus, calyce tubuloso 5-fido, lobis oblongis.

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905. Gesneria (Corytholoma) *guianensis*, sp. n., herbacea, erecta, piloso-hirtella, foliis oppositis breviter petiolatis ovatis oblongisve acutiusculis grosse crenatis basi angustatis obtusisve membranaceis sparse hirtellis subtus pallidis, pedicellis axillaribus solitariis v. geminis folio multo brevioribus, calycis laxi laciniis e basi lata subulato-acuminatis, corollæ tubo leviter incurvo vix ventricoso, galea retusa quam labium patenti-reflexum duplo longiore.—Rocky places of the Concon Mountains, *Schomburgk*.

Herba videtur 2-3-pedalis. Caulis teres. Pili hyalini in partibus novellis petiolis pedunculisque copiosi in foliorum pagina superiore sparsi breves, in inferiore ad venas pauci. Petioli 2-3 lin. longi. Folia 4-5 poll. longa, 2-2½ poll. lata, recentia valde aromatica. Pedicelli 1-1½-pollicares, pedunculo communi subnullo. Calyx (incluso acumine laciniarum) 6 lin. longus, laxus, subpentagonus, basi breviter adhærens. Glandulæ 2 posticæ majusculæ, connatæ, 3 minores distinctæ. Corolla hirtella, coccinea, sesquipollicaris, basi postice gibba et subito constricta, tubo versus medium leviter ampliato. Genitalia e tubo exserta. Stylus apice infundibuliformis, truncatus, intus stigmatosus. Capsula pubescens, rostro incurvo. Species affinis G. *chelonioidi*, sed foliis majoribus, calyce acuminato etc. diversa videtur.

906. Besleria *laxiflora*, sp. n., herbacea, ramulis junioribus petiolisque puberulis, foliis petiolatis oblongis acuminatis serratis basi angustatis supra glabris, pedunculis petiolo longioribus subracemoso-plurifloris, calycis sub-5-partiti laciniis lanceolatis subulato-acuminatis dimidium corollæ tubi superantibus.—Banks of rivers, British Guiana, probably from the neighbourhood of Roraima, *Schomburgk*.

Herba 3-6-pedalis. Partes juniores et venæ paginæ inferioris foliorum appresse pubescentes, planta cæterum glabra. Folia longiuscule petiolata, 4-5 poll. longa, 1½-1 poll. lata, cujusve paris subæqualia et vix inæquilatera, a medio ad apicem irregulariter serrata, basi integerrima. Pedunculi communes circiter pollicares. Pedicelli dimidio breviores, 5 ad 7, non ex eodem puncto orti ut in plerisque speciebus affinibus sed subracemosim dispositi. Calyx basi toro dilatato adhærens, segmenta 3½ lin. longa, foliacea, e basi latolanceolata longe acuminata. Corolla 6 (v. 7?) lin. longa, coccinea, glabra, subæqualiter tubulosa, sub fauce tamen paullulum ventricosa, limbi lobis brevibus, 2 superioribus altius connatis erectis, 3 inferioribus rotundatis patentibus. Stamina infra medium tubi inserta, inclusa, didynama cum rudimento quinti. Annulus hypogynus cupuliformis, integer. Ovarium ovato-conicum, glabrum. Fructus globosus, omnino

B. *luteæ*; pericarpium carnosum; semina minuta, numerosissima, albuminosa, testa tenui.

907. Alloplectus *Patrisii,* DC. Prod. 7. p. 545.—British Guiana, *Schomburgk.*

908. Centrosolenia *hirsuta,* gen. nov.—Banks of the Rio Parama, *Schomburgk.*

Char. Gen.—Calyx 5-partitus, segmentis serratis. Corolla tubulosa basi postice calcarata, fauce parum ampliata in limbum brevem latissime 5-lobum expansa. Stamina prope basin tubi inserta, didynama cum rudimento minuto quinti, inclusa. Annulus hypogynus obscurus, glandula postica maxima. Ovarium oblongo-conicum, hirsutum. Stylus apice dilatatus, subcapitato-stigmatosus. Fructus capsularis?

C. *hirsuta*: Caulis seu rhizoma abbreviatus, radicans. Folia subradicalia petiolata, ovali-oblonga, obtusa, duplicato-crenata, basi subcordata, utrinque pilis longis hyalinis hirsuta, 3-4 poll. longa, 1-1½ poll. lata, petiolo 1-3-pollicari hirsuto. Pedicelli ½-1-pollicares, axillares, solitarii v. plures in pedunculo communi brevissimo conferti, hirsuti. Calycis laciniæ 3-4 lin. longæ, oblongo-lineares, superne serratæ, hirsutæ. Corolla sesquipollicaris, hirsuta, roseo-alba, tubo fere recto, limbo fere *Nematanthi.*

I regret that the imperfect state of the flowers do not allow of a more ample description of this interesting plant, of which, as well as of most of the *Gesneriaceæ,* the collection contained but single specimens. As a genus, *Centrosolenia* is evidently allied to *Nematanthus,* but the spur of the flower, coupled with the habit and the toothed segments of the calyx appear sufficient to distinguish it.

909. Tapina? sp. n.—A single specimen without flower, from the Rio Parama, *Schomburgk.*

909. Episcia? *mimuloides,* sp, n., caule scandente radicante superne petiolis pedunculisque brevissime velutino-pubentibus, foliis petiolatis oblique ovato-oblongis acuminatis basi inæqualiter acutis superne sparse pilosulis subtus ad venas pubentibus, pedicellis in pedunculi brevi pluribus v. in axillis supremis solitariis, calycis 5-partiti segmentis ovato-

lanceolatis integerrimis acuminatis corollæ tubo triplo brevioribus.—British Guiana, *Schomburgk*, 2d coll. n. 125 (78) and 843 (1425).

Folia petiolata, 3-5-pollicaria, cujusve paris sæpe inæqualia, membranacea, crenata. Pedunculi communes 1-6 lin. longi, 1-7-flori. Pedicelli semi-pollicares, bracteis brevibus linearibus subtensi. Calycis segmenta viridia, ovato-lanceolata, acute acuminata, 5-7 lin. longa. Corollæ tubus 15 lin. longus, extus pilosiusculus, medio parum ventricosus, ad faucem leviter contractus; lobi 5, patentes, rotundati, inæquales, sed in flore unico a me examinato partim destructi. Stamina 2 prope basin tubi, 2 altius inserta, filamentis omnino liberis; quinti rudimentum nullum. Glandulæ desunt. Fructus globosus, vix carnosus, extus villosus, bivalvis, valvulis integris medio placentiferis; placentæ latæ, dorso affixæ, utrinque seminiferæ. Semina creberrima, fusiformia, funiculo longo subdilatato appensa, testa crassa spiraliter fibrosa, albumine parco v. nullo. In most respects this plant appears to agree with the *Besleria Guadalupensis* of De Candolle, which is most probably also an *Episcia*.

910. Tussacia *villosa*, sp. n., herbacea, foliis ovatis crenatis basi rotundatis et in petiolum breviter decurrentibus utrinque villosis, calycis ampli lobis abbreviatis latis dentatis, corollæ tubo calyce dimidio longiore dense villoso.—Concon mountains, *Schomburgk*.

Herba erecta, pede paullo altior. Folia supra medium caulis fere T. *pulchellæ* sed latiora, basi minus angustata. Inflorescentia eadem. Calyx ample campanulatus, coloratus, pilosus, demum 7 lin. longus; lobi latitudine sua multo breviores, acutiusculi. Corollæ tubus 9-10 lin. longus, multo villosior quam in T. *pulchella*, basi postice gibbus; limbus patens subæqualiter 5-lobus. Stamina supra basin tubi inserta. Glandula postica magna, et 1-2 anticæ parvæ. Capsula subglobosa, bivalvis. Semina funiculo brevi filiformi appensa; testa spiraliter fibrosa, albumen parcum v. fere nullum.

911. T. *rupestris*, sp, n., herbacea, humilis, foliis ovatis

crenatis basi rotundatis subcordatisve utrinque villosulis, calycis ampli truncati margine denticulato v. obscure 5-lobo, corollæ glabriusculæ tubo calyce duplo longiore.—Rocks, British Guiana, *Schomburgk.*

Herba semipedalis, in omnibus partibus multo minor quam T. *villosa*, et minus villosa. Calyx 5 lin. longus, margine inæqualiter denticulatus. Corollæ tubus 10 lin. longus, basi postice leviter gibbus, limbus amplus patens, lobis rotundatis. Stamina basi tubo inserta inclusa, didynama cum rudimento quinti, antheris liberis. Stylus apice infundibuliformi-dilatatus. Ovarium ovatum villosum. Glandula postica magna, antica nulla.

Genus *Tussacia*, a *Besleria* valde distincta, corollam habet stamina capsulam et semina *Episciæ*, a qua differt imprimis calyce. Herbæ sunt v. suffrutices, erectæ, basi radicantes. Folia supra medium caulis approximata, opposita. Pedunculi axillares, umbellatim pluriflori. Flores erecti. Calyces coccinei. Corollæ aurantiacæ.

Amongst the *Gesneriaceæ* in the collection I had inadvertently placed a specimen of a very curious shrub, which upon examination turned out to be a new genus of *Scrophulariaceæ*, allied to *Pentstemon*, but differing in habit, in the calyx, and in a very remarkable forked sterile stamen, having at first sight the appearance of a style and stigma. My specimen is in some respects much injured, and I have not been able to ascertain the precise inflorescence, but the plant is so remarkable that I here insert a character as complete as the specimen will admit of, regretting that I had overlooked it in working up the order for De Candolle's Prodromus.

912. Digomphia *laurifolia*, gen. nov. *Scrophulariacearum* e tribu *Cheloniearum.*—Roraima, *Schomburgk*, 1st coll. n. 1049.

Char. gen. Calyx tubuloso-campanulatus, 5-plicatus, demum 3-5-fidus. Corolla tubulosa, incurva, fauce campanulata, limbi lobis 5 latis subæqualibus. Stamina fertilia 4, didynama, inclusa; quintum sterile exsertum, apice bifidum,

lobis lineari-clavatis. Ovarium biloculare, ovulis in quoque loculo plurimis biseriatis. Capsula ....

Frutex humilis, erectus, undique glaberrimus, parce ramosus. Folia breviter petiolata, oblonga, obtusa, basi angustata, 2-3 poll. longa, 6-12 lin. lata, integerrima, crasso-coriacea, supra nitidula, costa media subtus prominula. Pedunculi (ex axillis supremis orti? v. in racemulos terminales dispositi?) pollicares, supra medium articulati et ibidem forte nonnunquam ramosi. Calyx 7-8 lin. longus, angulato-plicatus, coloratus, demum usque ad medium secus plicas fissus in lobos 3 ad 5 ovato-oblongos; in calyce juniore lobi breves videntur æstivatione imbricati. Corolla sesquipollicaris v. paullo longior, basi per brevem spatium tenuis, dein gradatim in faucem longam subcampanulatam ampliatus, intus extusque glabra. Antherarum loculi divergentes, iis *Pentstemonis* similes. Stamen sterile corollam breviter superans, supra medium postice papilloso-tomentosum, lobis 2-3 lin. longis obtusis undique papilloso-tomentosis. Ovarium oblongum, glaberrimum, cinctum disco carnoso brevi crenato. Stylus filiformis apice breviter divisus in lobos 2 subæquales laminæformes.

New Hepaticæ, *by* Thomas Taylor, M.D.

(*Continued from p.* 284).

7. Lophocolea, *Nees.*

1. L. *Beecheyana*, Tayl.; caule laxe implexo, procumbente, vage ramoso; foliis imbricatis, patentibus, lanceolatis, emarginato-bispinosis, margine dorsali incurvo, integerrimo, ventrali subunidentato, in stipulam oblongam, obtusam, 4-spinosam utrinque abeuntibus; perichætialibus erectis, ciliatis; calyce oblongo, trigono, trialato, (ala spinosa,) ore ciliato.

Hab. Oahu. *Beechey, Hook. Herb.*

Creeping among other Hepaticæ; pale olive-green. Stems

about ½ an inch long and 1-20th of an inch broad; branches few. Some plants are monoicous, having calyces on one shoot and *perigonia* on another; perigonial leaves imbricated, ventricose, with an incurved, tumid process, containing an anther at the base, the elongated tops reflexed; there are at least two pairs of erect and ciliated perichætial leaves. On the calyx a lanceolate wing is on each of the three angles, and has 3-4 spinous *ciliæ*. This has the habit of L. *leucophylla*, Tayl., but is a greener and somewhat a larger species; the leaves are far narrower at their bases and nearly entire.

2. L. *pertusa*, Tayl.; caule implexo, adscendente, subramoso; foliis imbricatis, patentibus, triangulari-ovatis, margine subflexuoso, bidentatis, subintegerrimis, in stipulam subrotundam, 4-dentatam utrinque abeuntibus; calyce terminali, lineari-oblongo, trigono, anguste alato, apice spinoso-dentato; foliis perichætialibus 3-4-dentatis.

HAB. Rio de Janeiro; n. 43. *Gardner, Hook. Herb.*

Patches wide, pale olive-green. Stems about 1 inch long. Leaves with a shallow *sinus* near their junction with the stipule, sometimes tri-dentate. Calyx twice as long as the leaves, with a very narrow wing on each of the two inferior angles. Stipules oblique. Capsule linear-oblong. Differs from L. *connata*, Swartz, by the 4-dentate stipules, by the narrow wing to the calyx, and by the perichætial leaves having 3-4 distinct teeth.

3. L. *hirtifolia*, Hook. fil. et Tayl.; caule disperso, procumbente, subsimplici; foliis subimbricatis, patentibus, recurvo-concavis, late ovatis, obtusiusculis, subdenticulatis, celluloso-hirtis, in stipulam subquadratam, 4-laciniatam utrinque abeuntibus.

HAB. With *Sticta chloroleuca*, Hook. fil. et Tayl. Van Diemen's Land.

Patches very loose, plants usually scattered. Stems scarcely ¼ inch long, slightly bent; shoots tumid on account of the recurved leaves, pale green. Leaves rotundato-ovate, minutely tomentose from the projection of the cells, very irregularly and sparingly denticulate at the tops. Allied to L. *mu-*

ricata, Gottsche, from the Cape of Good Hope, which, however, is smaller, has the leaves bidentate and strongly muricate, while the stipules are more minute and simply bifid.

4. L. *subemarginata*, Hook. fil. et Tayl.; caule subsimplici, repente, vage ramoso; foliis imbricatis, complanatis, patentibus, oblongis, retuso-emarginatis, integerrimis, margine ventrali gibboso, stipulis minutis, quadrifidis altero latere connatis; calyce terminali, lineari-oblongo, trigono, ore aperto, trifido, dentato.

HAB. On bark; Van Diemen's Land. *Gunn, Hook. Herb.*

Patches straggling, brown. Stems 1-2 inches long. Leaves loosely imbricated, thin and largely cellulose, usually with a very shallow, obtuse *sinus*, yet some of the lower leaves are bidentate or irregular at the *apices*. Calyx twice as long as the leaves, subtruncate; perichætial leaves bidentate. This is a much larger plant than our L. *textilis*, from Falkland Islands; the gibbous inferior margin of the leaves, their larger cells, and the deeper division of the stipules, readily distinguish it.

5. L. *polyclada*, Hook. fil. et Tayl.; caule implexo, procumbente, subsimplici; foliis imbricatis, patentibus, semicordatis, obtusissimis, integerrimis, antice subcurvatis; stipulis liberis, ex lata basi 6-ciliatis.

HAB. New Zealand; n. 76. *Herb. Mus. Paris.*

Patches wide, close, flat, brown, shining when dry. Stems 2-3 inches long, but little branched. Stems black. Leaves curving forwards. Stipules rather large, yet not imbricated, nor connate to the leaves. Closely resembling L. *planiuscula*, Hook. fil. et T. but the leaves are longer, their anterior margin curved forwards, nor do they diminish in size upwards, and the 6-lacinated stipules are much wider than the stems.

6. L. *divaricata*, Hook. fil. et Tayl.; caule implexo, procumbente, ramoso; foliis approximatis, suberectis, secundis, ex angusta basi oblongis, convexis, bifidis, segmentis lanceo-

latis, acuminatis, divaricatis, subflexuosis; stipulis bifidis, segmentis subulatis extus unidentatis.

HAB. Cape Horn; *Dr. Hooker.*

Patches whitish-green. Stems about 1 inch long, branched towards the base. Leaves loosely set, largely cellulose, their *sinus* acute, divided for half their length into two divergent acuminate segments, the dorsal margin decurrent and recurved. The *perigonia* are terminal spikes of closely adpressed leaves, whose tumid bases contain the anthers, and whose subdivisions are shorter than of the cauline leaves. Allied to L. *leptantha*, Hook. fil. et T. likewise from Cape Horn, differing by its smaller size, by its leaves with narrower bases, and summits more deeply divided, and by the bipartite stipules.

7. L. *triacantha*, Hook. fil. et Tayl.; caule implexo, procumbente, vage ramoso; foliis complanatis, approximatis, patentibus, oblongo-ovatis, trispinosis; stipulis subquadratis, bifidis, segmentis bilaciniatis, laciniis subulatis.

HAB. East Falkland, *Lyall.* n. 67. New Zealand, *Herb. Mus. Paris.*

Patches thick, dusky olive-green. Stems about 1 inch long, branches few, patent. Leaves scarcely imbricating at their bases, at right angles to the stem, oblong, with two *sinuses* and three subulate spines. Stipules free, erecto-patent, having four subulate segments. It is allied to our L. *chlorophylla*, from New Zealand, which, however, is a smaller plant and has shorter, wider, subsecund leaves, as also subrotund dentate stipules.

8. *Lepidozia*, Nees.

1. L. *filipendula*, Tayl.; caule laxe cæspitoso, erecto, filiformi, pinnato, arhizo; ramis attenuatis, dependentibus; foliis minutissimis, distantibus, quadratis, caule angustioribus, cauli adpressis, erectis, caulinis subtrifidis, rameis stipulisque bifidis, segmentis spiniformibus.

HAB. Sandwich Islands. *Tolmie, Hook. Herb.*

Patches pale olive. Stems 2-3 inches long; branches rather short, fine as human hair, curved downwards, and when dry, variously flexuose. We have not seen L. *Sandvicensis*, Ldbg. to which ours must be closely related; but this is said to have deeply quadrifid leaves on the branches, and the *laciniæ* of the stipules to be obsoletely denticulate or bidentate.

2. L. *humillima*, Tayl.; caule implexo, prostrato, subpinnato, flagellifero; foliis arcte imbricatis, ovatis, bifidis, segmentis acuminatis; stipulis minutis, ovatis, bifidis; calyce ventrali, ovato-lanceolato, subplicato, ore subintegerrimo.

HAB. North-west coast of America? *Menzies, Hook. Herb.*

Patches minute, whitish. Stems about 3 lines long; the older branches with more closely imbricated and larger leaves than the younger or flagelliform shoots. Calyx sometimes situated beneath a flagelliform shoot. Perichætial leaves longer than the cauline, and with longer segments. Calyx three times as long as the leaves. The bifid leaves separate this species from its congeners.

3. L. *triceps*, Tayl.; caule implexo, procumbente, subpinnato; foliis imbricatis, patentibus, stipulisque oblongis trispinosis; calyce ventrali, lanceolato, sursum plicato; foliis perichætialibus concavis, erectis, adpressis, late ovatis, subdenticulatis.

HAB. Owhyhee. *Menzies, Hook. Herb.*

Patches minute, pale olive. Stems scarcely 4 lines long. Leaves rather loosely imbricated, concave. Stipules minute. This is not unlike our common L. *reptans*, Nees., its leaves, however, are more distant, more concave, and divided into three spinous teeth.

4. L. *attenuata*, Tayl.; caule laxe cæspitoso, adscendente, pinnato; ramis secundis attenuatis; foliis laxis, erectiusculis, concavis, quadrato-oblongis, quadrifidis; stipulis minutis rotundatis, quadrifidis; calyce ventrali, majori, ex angusta basi lanceolato.

HAB. North-west coast of America. *Menzies, Hook. Herb.*

Stems 1 or 2 inches long, pale olive-brown. Shoots in a

dry state, appear knotted with distant, rounded, adpressed leaves; segments of the leaves lanceolate. Perichætium of 3 or 4 pairs of concave, broad, oblong leaves, whose divisions at top are very shallow. This has much the habit of *Jung. microphylla*, Hook.; but the branches are far more simple, and the leaves larger and more concave.

5. L. *tetrapila*, Hook. fil. et Tayl.; caule implexo, procumbente, subpinnato; ramis attenuatis; foliis stipulisque imbricatis, basi oblongis, patentibus, apice erectis quadrispinosis, spinis articulatis, cellulis majoribus.

Hab. New Zealand; n. 119. 1844. *Dr. J. D. Hooker.*

Tufts loose, pale olive-brown. Stems about 1 inch long, sometimes closely pinnated again with distant, irregularly placed branches, which on the tops of the plants are often incurved. Flagelliform shoots are likewise present. Leaves with bases patent even in the dry state. Cells remarkably large and strongly defined. No fruit observed. This plant is larger than L. *lævifolia*, Hook. fil. et T. and has much longer leaves; again, L. *plumulosa*, Gottsche, and L. *capillaris*, Nees, have the divisions of the leaves quite setaceous, whilst in our plant they are spines with broad bases.

6. L. *parvistipa*, Tayl.; caule debili, laxe implexo, procumbente, pinnato; foliis approximatis, subpatentibus, grosse cellulosis, oblongis, quadrispinosis, antice subgibbosis; stipulis minutis, subquadratis, quadridentatis.

Hab. Swan River. *Mr. James Drummond.*

Patches very loose, pale glaucous-green. Stems almost 2 inches long, rather unequally pinnated; stipules nearly square, scarcely exceeding the stem in breadth. Related to L. *glaucophylla*, Hook. fil. et T., but the leaves are much longer and their cells larger, whilst the stipules are relatively much smaller.

7. L. *coilophylla*, Tayl.; caule laxe cæspitoso, procumbente, pinnato; ramis attenuatis, flagelliformibus; foliis stipulisque imbricatis, rotundato-ovatis, quadridentatis, concavissimis.

Hab. Gongo Soco. *Mr. Bunbury, Hook. Herb.*

Patches wide, whitish-green. Stems 1 inch long; the lower branches short, the upper frequently elongated into flagelliform terminations. Leaves and stipules remarkably concave, so that when dry they appear as corrugated sacks, by which character and by its more distant branches the plant may be distinguished from its nearest ally, L. *reptans*, Nees.

8. L. *chordulifera*, Tayl.; caule implexo, adscendente, pinnato; ramis apice attenuatis, decurvis; foliis obliquis, stipulisque arcte imbricatis, erecto-patentibus, quadratis, quadrifidis, basi utrinque subdentatis, segmentis lanceolatis; calyce ventrali, cylindraceo, acuminato, subplicato, incurvo.

HAB. Chonos Archipelago, n. 461; *Darwin, Hook. Herb.*

Tufts loose, whitish olive. Stems nearly 2 inches long, regularly pinnate, the branches attenuated, deflexed. Leaves concave, their bases wide and furnished at each side with one or two distinct teeth; segments of leaves and stipules unequal. Perichætial leaves erect, their segments dentate. Nearly allied to L. *cupressina*, Lindbg., but distinct by the dentate bases of the leaves, by their closer imbrication, and by their cellules being much more minute, although the species is far larger.

9. MASTIGOBRYUM, *Nees.*

1. M. *pycnophyllum*, Tayl.; caule laxe cæspitoso, procumbente, ramoso; ramis basi subdenudatis; foliis arcte imbricatis, subsecundis, patentibus, subrecurvis, lineari-oblongis, apice subrotundatis, subtridenticulatis, medio grosse cellulosis; stipulis minutis late quadrato-rotundatis eroso-denticulatis.

HAB. With *Jung. stolonifera, Sw.* Jamaica; *Swartz, Hook. Herb.*

Patches pale but dusky olive-green. Shoots about 3 lines long, usually divested of leaves at the bases; towards the middle having flagelliform branches. Leaves closely imbricated, at right angles to the stem, their tops slightly recurved; they have large cells along their *axes*. This is related to M.

Vincentinum, Ldbg., whose leaves, however, are more distant and more deeply toothed, the stipules oblong, the colour paler, and its size greater.

10. Sendtnera, *Endlicher.*

1. S. *runcinata,* Tayl.; caule cæspitoso, erecto, apice incurvo; foliis incubis, distichis, erecto-patentibus, secundis, stipulisque imbricatis, concavis, cordato-oblongis, bifidis, basi margine runcinato-dentatis, segmentis lineari-lanceolatis, canaliculatis, curvatis.

Hab. Chiloe, *Cuming, Hook. Herb.*

Tufts dense, wide, brownish-olive. Stems about 2 inches high, hard, sparingly branched, the branches erect, slightly incurved at the top. Leaves closely imbricated, with a pellucid nerve of a yellower colour than the rest of the leaf, bifurcating and running up each of the segments. Approaching S. *juniperina,* Endl., a plant far more elongated and slender, with leaves more crowded and narrower, and which are scarcely runcinato-serrate on the margins near the base.

2. S. *pensilis,* Tayl.; caule laxe implexo, elongato, subsimplici, flexoso, pendente; foliis stipulisque laxis, erecto-patentibus, concavis, integerrimis ex lata amplexante basi subulatis, bifidis, segmentis linearibus canaliculatis, curvatis.

Hab. Woods of Pichincha. *Prof. William Jameson, Hook. Herb.*

Patches hanging from trees, pale yellowish-olive, or reddish-brown. Stems nearly a foot long, waved, sparingly branched, subcompressed. Leaves and stipules rather distant, very brittle when dry, so that the linear segments having been broken off are rarely visible, elongato-subulate, the segments very narrow, and for the most part divergent. The simpler, subcompressed, elongated, waved and pendent stems, and more distant leaves easily separate this from S. *juniperina,* Endlicher.

3. S. *æquabilis,* Tayl.; caule laxe implexo, adscendente, basi

nudo, bipinnato, minutissime albido-squamoso; ramis complanatis, attenuatis, subdistantibus, decurvis; foliis imbricatis stipulisque erectiusculis, oblongis, bi-tri-quadrifidis, laciniis lineari-lanceolatis, apicalibus incano-dentatis.

HAB. Woods of Pichincha; n. 337. *Prof. William Jameson, Hook. Herb.*

Pale olive. Stems 6 inches long; branches bending down, flattened into one plane. Leaves and stipules nearly of the same size, those of the tops of the shoots usually bifid, where they are collected into a *capitulus*. The bipinnate stems, compressed branches, and leaves destitute of *ciliæ* at the base distinguish this species from S. *ochroleuca*, Nees.

4. S. *pruinosa*, Tayl.; caule laxe cæspitoso, erectiusculo, sursum bipinnato; ramis compressis, superioribus apice incrassatis; foliis arcte imbricatis, late ovatis, 4-partitis, segmento interiori latiori, ciliato, cæteris elongate acuminatis, spinoso-dentatis, dentibus incanis; stipulis bipartitis, segmentis bifidis, ciliato-dentatis.

HAB. Woods of Pichincha; n. 337. *Prof. William Jameson.*

Stems eight inches high; branches hoary at their base, light olive brown at their tops. Leaves with the superior or dorsal margin strongly ciliated and hoary. This species differs from S. *ochroleuca*, Nees, by the greater size, browner colour, fewer attenuated or flagelliform shoots, more compressed branches, whilst the leaves and stipules are more ciliated and all their segments dentate. Sent by Prof. Jameson under the same number as the preceding.

5. S. *spinosissima*, Hook. fil. et Tayl.; caule laxe cæspitoso, adscendente, lævi, bipinnato; surculis sursum confertis, attenuato-flagellaribus; foliis stipulisque erecto-patentibus, ex lata subquadrata basi quadripartitis, segmentis setaceis, rigidis, integerrimis.

HAB. New Zealand. *Edgerley, Hook. Herb.*

Pale olive. Stems nearly 3 inches long; branches fastigiate above. Leaves of the main stem more patent; the segments of all stiff when dry. Allied to *Jung. Scolopendra*, Hook., and to S. *ochroleuca*, Nees; differing from the first

by its bipinnate ramification, from the second by the entire segments of the leaves and stipules; and from both by the segments being not hoary.

11. Radula, *Nees.*

1. R. *Gottscheana*, Tayl.; caule debili, procumbente, elongato, laxe subbipinnato, pinnis patenti-recurvis; foliis approximatis, patentibus, integerrimis, planis, subdecurrentibus, caulinis angulato-rotundatis; rameis oblongo-rotundatis lobulis caulinis cordatis, caulem transeuntibus atque appendiculum oblongum, undulato-crispum, obtusum, convexum demittentibus, rameis minoribus, cauli adnatis, basi tumidis, apice triangularibus, subinflexis.

Hab. St. Domingo. *Dickson.* 1814.

Patches loose, olive-green. Stems 3-4 inches long, irregularly pinnate, the branches subpinnate, deflexed. Leaves by no means imbricated, the cauline rather broader than long, their margins flexuose, their *apices* obtuse, they are sinuate at their junction with the lobule: this lobule is singular in the genus, for it sends obliquely down, after it has crossed the stem, a waved oblong process, more than twice as long as the lobule itself, and which partly embraces the stem. Thus the lobule reminds one of the auricle of the leaf of *Frullania hians*, L. et Lind. I have inscribed this species to my friend, who has devoted his superior talents to the successful illustration of the *Jungermannieæ*.

2. R. *ramulina*, Tayl.; caule debili, elongato, procumbente, pinnato; ramulis brevibus, patentibus; foliis subimbricatis, complanatis, lobulisque latis, quadrato-rotundatis, extrorsum obtusangulis, introrsum caulem transeuntibus, integerrimis; calyce axillari, sessili, ex angusta basi campanulato, compresso, ore subintegro.

Hab. On trunks of trees, on Cayambe; 13,500 feet high. *Prof. William Jameson*; also n. 335, on Pichincha, *Prof. W. Jameson.* 1844.

Patches loose, tawney. Stems 3-4 inches long, embraced by the leaf and lobule, both of which exceed it on either

side. Perigonial shoots alternate, one to each leaf, and scarcely extending beyond it. Pedicel about twice as long as the calyx. Capsule cylindrical. This has been supposed to be a variety only of *Radula pallens*, Sw., by the distinguished editors of the *Synopsis Hepaticarum*; but it is probable that they never saw the calyx, whose breadth is plainly distinctive, independent of the larger, wider, and exteriorly angulate leaves and lobules. The pinnate ramification is not confined to the male plant. It appears to us far nearer to our Irish *Radula Voluta*, it wants, however, the remarkable volution at the inner margin of the base of the leaves and lobules.

3. R. *Jamesoni*, Tayl.; caule implexo, procumbente, pinnato; ramis complanatis, brevibus, patentibus ; foliis subapproximatis, rotundatis, recurvis, decurrentibus, planiusculis, margine subflexuosis, integerrimis; lobulo cauli adnato, apice triangulari-oblongo, obtuso, margine incurvo, transversim adscendente.

HAB. Woods on Pichincha; *Prof. W. Jameson*, n. 335. *Hook. Herb.*

Patches loose, very pale tawney. Stems 4 inches long, pinnate, with alternate, rather distant, short, patent branches. Leaves scarcely touching one another, flat. Lobule crossing the stem, and adpressed to it. So like is the present to the preceding species that Professor Jameson seems to have sent them at different times under the same n. 335, but the lobule of R. *ramulina*, Tayl., is much wider, rhomboidal in shape, extends on either side beyond the stem, and is not at all tumid: the cellules of the leaves, too, are larger.

4. R. *cordiloba*, Tayl.; caule implexo procumbente, subpinnato; ramis complanatis, erecto-patentibus; foliis laxe imbricatis, oblongis, apice rotundatis, recurvis, integerrimis, decurrentibus; lobulis cordatis, obtuse apiculatis, supra caulem protractis; calyce axillari, lateralique, sessili, ex angusta elongata basi cylindrico, ore compresso, truncato, minutissime crenulato; perichætio foliis breviore.

HAB. Pacific Isles. *Nightingale, Hook. Herb.*

Patches wide, olive-brown. Stems 4-5 inches long. Branches curved upwards, pinnules short. The junction of the leaf to the lobule is sinuate beneath. Lobule cordate, embracing the stem by a decurrent junction with the leaf. Perichætial leaves two, erect, shorter than the cauline. Calyptra with an elongated and contracted base, elliptical above. Capsule cylindraceous. Seeds angulato-rotund, with a thick, pellucid, yellowish-olive tunic containing a dark green granulous mass. *Elateres* with double, close convolutions. This differs from Swartz's specimens of his *Jung. pallens*, Flor. Ind. Occid., by the longer stems, by the darker and greener colour, by the more oblong leaves, which have smaller cellules, by the lobule partly crossing the stem, and having the inner margin free, while the *apex* is less incurved, and by the more slender calyx. From R. *reflexa*, Mont. et Nees, ours is distinguishable by the larger and more recurved leaves, by their minuter cellules, by the lateral sessile *perichætia*, and by the more slender calyx.

5. R. *recubans*, Tayl.; caule dense implexo, adscendente, subdichotomo, subpinnato; ramis patentibus; foliis approximatis, patentibus, subrotundis, planis, integerrimis; lobulis majoribus, rotundato-subquadratis, introrsum caulem transeuntibus, liberis, rotundatis, extrorsum obtuse apiculatis, exciso-sinuatis; perichætiis axillaribus lateralibusque, sessilibus.

HAB. Demerara. *Herb. Grevill.* (sub nomine *Jung. Boryanæ*).

Patches dense, dusky-green. Stems 2-3 inches long. Leaves scarcely imbricated. Lobules with a tumid, amplexicaul base, slightly incurved above, the apex obtusely angular and pointing outwards; the lobule has a *sinus* exteriorly. This species approaches near to *Radula Javanica*, Gottsche, (we allude to the specimens from Owhyhee quoted in the *Syn. Hepat.*), differing by the greater size, more round leaves, larger lobules, which pass across the stem interiorly, and which exteriorly are sinuato-emarginate, by the closer cellulation of the leaves, and decisively by the sessile *perichætia*.

6. R. *pocillifera*, Tayl.; caule implexo, procumbente, vage subpinnato; ramis brevibus, subpatentibus; foliis laxe imbricatis, patentibus, rotundatis, integerrimis; lobulis minutis, cauli adnatis, subquadratis; perichætio axillari, sessili; calyce abbreviato, campanulato, ore latiori compresso, truncato, minute atque obsolete crenulato.

HAB. St. Domingo. *Dickson.* 1814.

Patches wide, pale olive-green. Stems scarcely 1 inch long. Leaves concave, nearly round, patento-recurved. Lobules minute, their interior margin lying on, but not passing the stem. Calyx singularly short, resembling in outline an equilateral triangle, the mouth wide, compressed, its crenulations observable only under a high power of the microscope. It is related to R. *pallens*, Sw., but is a smaller plant; its calyx is at once distinctive.

7. R. *strangulata*, Hook. fil. et Tayl.; caule exiguo, implexo, procumbente, subpinnato; foliis imbricatis, patenti-recurvis, rotundato-obovatis, integerrimis; lobulis minutis, ex curvata tumente basi apice angulatis, cauli adpressis; perigoniis quadrato-oblongis, in surculorum cursu sitis atque surculo angustioribus.

HAB. New Zealand. *Dr. J. D. Hooker.* 1840.

Patches small, olive, pale. Stems scarcely exceeding three lines in length. Leaves slightly overlapping; their cellules very minute; the perigonial smaller and rounder, their lobule swelling and containing the anther. This species is remarkable for the short *perigonia* occurring in the course of the shoots, and nearly upon all the shoots. Branches are scarcely ¼ of a line wide. This is unlike any species with which we are acquainted, and has the size and habit of our common *Lejeunia serpyllifolia*, Nees.

8. R. *Miqueliana*, Tayl.; caule implexo, procumbente, debili, pinnato; foliis laxius imbricatis, patentibus, oblongo-ovatis, obtusis, planiusculis; lobulo caulem amplexante, apice obtusiusculo, patenti-recurvo; calyce axillari, lineari-oblongo, ore truncato.

HAB. Java, in Prov. Buitenzorg. 1843. *Dr. Miquel, Herb. Hook.*

Patches creeping among *Musci*, very pale olive-green. Stems about 1 inch long, subbipinnate. The lobule, on the full grown stems, is amplexicaul, and has a patent summit, and exteriorly a deep *sinus*, which is sufficient to separate this species from our R. *recubans*, independent of the more ovate leaves.

9. R. *retroflexa*, Tayl.; caule implexo, procumbente, ramoso; foliis subimbricatis, patenti-reflexis, oblongis, apice rotundatis, integerrimis; lobulis erectis, cauli adpressis, subimbricatis, lanceolatis, obtusiusculis, decurrentibus.

HAB. Pacific Isles. *Nightingale, Hook. Herb.*

Patches wide, yellowish dusky-olive. Stems more than 1 inch long. Leaves recurved from where they join the lobule, rather long. Lobules pointing forwards, imbricated so as nearly to conceal the stems. We have not seen the R. *lingulata*, Gottsche, from Java, but if we may judge of the brief description in *Syn. Hepat.*, ours is closely allied to it; differing by the decurrent leaves and more lanceolate lobules.

12. MADOTHECA, *Dumort.*

1. M. *squamulifera*, Tayl.; caule laxe cæspitoso, adscendente, vage bipinnato, squamuloso; pinnis patenti-recurvis; foliis imbricatis, patentibus, subquadratis, ovatis, apice recurvis, basi undulatis, integerrimis; lobulis stipulisque oblongis, obtusis, basi processus minutos demittentibus; calyce subsessili, laterali, late ovato, compresso, ore angustato, denticulato.

HAB. Pillzhum, Columbia, 1827. *Prof. William Jameson, Hook. Herb.*; also in woods at Baños, and in the Forest of Esmeraldos, *Jameson.*

Tufts wide, brownish-olive. Fronds complanate. Stems 6-8 inches long, covered with minute, waved, and involute scales. Perichætial leaves obtuse, most minutely toothed,

subpatent. Pedicel about twice as long as the calyx. Capsule oblongo-ovate. This approaches M. *Douglasii*, Tayl., in habit; but the scaly stems and the narrow-mouthed and distinctly toothed calyx will readily distinguish it.

2. M. *arborea*, Tayl.; caule laxe cæspitoso, adscendente vage bipinnatim ramoso, ramis attenuatis, subflagelliformibus, deflexis; foliis laxe imbricatis, patentibus, late ovatis, obtusis, margine undulatis, basi ciliato-dentatis; lobulis stipulisque oblongis, obtusis, basi processus lineares ferentibus, perichætialibus erectiusculis, acutis, dentatis; calyce campanulato, laterali, oris laciniis lanceolatis, ciliato-dentatis.

Hab. On Pichincha, and in woods on Assuay, Peru, at 10,000 feet elevation. *Prof. William Jameson, Hook. Herb.*

Tufts loose, brownish-olive. Stems 10-12 inches high; shoots complanate. Leaves obtuse, waved, especially on the ventral margin. Calyptra large, rather opaque and brown! Calyx split down on one side. Pedicel about twice as long as the calyx. Capsule oblongo-ovate. This is allied to the preceding, differing, however, by the wide mouthed calyx, with acuminate *laciniæ*, and very remarkably by the dentato-ciliate, acute perichætial leaves. Again, the base of the leaf is not decurrent, as in M. *subciliata*, L. et Ldbg., nor are the lobules imbricated or ligulate. The larger fronds, bipinnate ramification, and the complanate and more patent leaves separate ours from M. *Leiboldi*, Gottsche.

2. M. *Douglasii*, Tayl.; fronde lanceolata, utrinque acuminata; caule laxe cæspitoso, adscendente, subbipinnato; pinnis attenuatis, patenti-recurvis, foliis imbricatis, patenti-recurvis, subrotundato-ovatis, apice recurvis, margine planis, oblique cordatis, basi recurvis, obtusis; stipulis late ovato-oblongis, decurrentibus, integerrimis; calyce laterali, exangusta basi rotundato-obovato, compresso, ore amplo, recurvo, minutissime denticulato.

Hab. North-west coast of America. *Douglass, Hook. Herb.*

Yellowish olive-green. Stems 6-8 inches long; pinnules very slender. *Perigonia* occupying the place of pinnules,

and so arising from the *pinnæ*, short, linear obtuse spikes, parallel with the principal stem. *Perichætia* usually occupying the place of *pinnæ*, and so arising from the principal stems. Calyces nearly sessile, having but one or two pairs of perichætial leaves. Pedicels about twice as long as the *calyces*. Capsule oblong, split down to the base into four segments. At the inner base of the lobules of the larger leaves a most minute revolute process occurs. This differs from M. *navicularis*, Nees, if we may trust to the characters given of the latter in the *Synopsis Hepaticarum*, by the more elongated fronds, acuminated at both ends, by the closer and more attenuated branchlets, by the rotundato-ovate leaves, whose posterior bases are not undulated and crisped, by the less considerable lobule, by the oblongo-ovate stipules and by the wider mouth of the calyx, the denticulations on whose mouth are observable only under a high power of the microscope.

4. M. *obtusata*, Tayl.; caule laxe cæspitoso, adscendente, pinnato; pinnis alternis, brevissimis, obtusatis; foliis imbricatis, patentibus, rotundato-rhomboideis, apice subacutis, reflexis, margine integerrimis, basi amplexante postice elongata; lobulis oblongo-ovatis obtusis, hinc gibbis, margine reflexis basi amplexante utrinque elongata; stipulis ex ovata basi angustius oblongis, margine reflexis basi utrinque elongatis subdentatisque.

Hab. Canaries. *Lemann, Hook. Herb.*

Tufts flattish, wide, dusky olive-green. Stems 2-3 inches long. Branches numerous, crowded, very short, erecto-patent. Leaves closely imbricated, the dorsal margin nearly patent, the ventral more rounded and irregularly waved at the base; the lobules and stipules have on each side of the base a free, waved and toothed process; the lobule is unconnected with the leaf. This species resembles male individuals of *Jung. Thuja*, Dickson, yet differs by the want of gloss to the foliage, by the more closely pinnated stems, by the shorter branches, and by the more considerable appendages to the lobules and stipules.

5. M. *recurva*, Tayl.; caule laxe cæspitoso, adscendente, tripinnato, surculis gracilibus, complanatis; foliis imbricatis, erecto-patentibus late triangulari-ovatis, integerrimis, margine dorsali gibboso, ventrali recurvo; lobulis complicatis, linearibus, cauli subadpressis; stipulis lineari-triangularibus, acutiusculis, apice recurvis basi amplexantibus, decurrentibus; calyce sessili, laterali, orbiculari-ovato, ore angustato, plicato, subquadridentato.

HAB. Colchaque; South America; n. 44. *Hook. Herb.*

Pale olive-green. Stems 5-6 inches long; branches patent. Leaves closely imbricated, short; the lobule united by its entire base, slightly curved next to the stem. *Perigonia* and *Perichætia* on the anterior edges of the branches; the former are very short spikes; the latter composed of a few subentire leaves. This is allied to our M. *gracilenta*, from Conception, but the leaves are smaller and more crowded, the lobule joined by its entire base to the leaf, the stipules more narrow and acute, and the *calyces* narrower.

6. M. *gracilenta*, Tayl.; caule laxe implexo, adscendente, subbipinnato; ramis attenuatis, decurvis; foliis subimbricatis, subpatentibus, late oblongo-ovatis, obtusis, apiculatis, integerrimis, margine ventrali recurvo; lobulis ligulatis, margine reflexis, subdecurrentibus; stipulis ex decurrente cordata basi oblongis emarginatis, subbidentatis; calyce sessili, laterali, rotundato, compresso, convexo, ore minuto denticulato; foliis perichætialibus subdentatis.

HAB. Conception; n. 152, *Beechey, Hook. Herb.*

Patches loose, tawney olive. Stems 2-3 inches long; branches subfastigiate towards the tops of the stems. *Perichætia* small compared with the calyx, their leaves patent, acute, subdentate, their lobules lanceolate, their stipules nearly round, emarginate, strongly dentate. Pedicel scarcely exserted. Capsule oblong. This has some resemblance to *Jung. distans*, Schweinitz, (which, probably includes both M. *Porella*, Nees, and M. *rivularis*, Nees,) the similitude, however, is limited to the small-mouthed and round calyx;

for the apiculate leaves and emarginate stipules readily distinguish them.

7. M. *Columbica*, Tayl.; caule subcæspitoso, adscendente, bi-tripinnato; ramis patentibus; foliis approximatis, erecto-patentibus, ex angusta basi subrotundis, convexis, margine exteriori recurvis, basi planis; lobulis stipulisque obovatis, margine subreflexis, basi runcinato-subunidentatis; perigoniis ovato-oblongis, sessilibus.

HAB. Pillzhum, Columbia. *Prof. William Jameson.*

Pale tawney-olive, somewhat greener at the tops of the stems, which are 4-5 inches long, distantly pinnate, with short patent branches, which again appear minutely pinnulate, with perigonial branchlets. Leaves scarcely imbricated, oblique, nearly round. Lobules scarcely attached to the leaves, the upper ones subacute, slightly incurved towards the stem. This differs from *Jung. platyphylloidea*, Schweinitz, by the narrower and flatter shoots, the more distant leaves, their minuter cells, and by the lobules and stipules being fringed at their bases, with a few spinous teeth. We have not seen M. *subciliata*, L. et Lind.; ours, however, disagrees with the characters given of that species by the rotundate, (not ovate), leaves by the want of any decurrent ciliato-dentate base to the leaves, by the lobules not being imbricated, nor ligulate, but obovate, and by the runcinato-dentate bases of both lobules and stipules.

13. BRYOPTERIS, *Lindbg.*

1. B. *fruticulosa*, Tayl.; caule laxe cæspitoso, erecto, pinnato; ramis approximatis, patentibus; foliis imbricatis, patentibus, oblongo-ovatis, acutis, dentatis, margine ventrali prope lobulum sinuato, subplano; lobulis minutis, tumidis, ovatis, involutis, subunidentatis; stipulis obovato-rotundatis, dentatis, margine subrecurvis.

HAB. St. Domingo; n. 39. *Hook. Herb.*

Dark olive-brown; shoots nearly 2 inches high; branches about ½ an inch long. The species of *Bryopteris* are most

nearly allied. In the Synopsis Hepaticarum, B. *filicina*, Swartz, and *Jung. filicina*, Hook. are united; but although Swartz may have collected both, and placed both under one name in his herbarium, yet we believe that a specimen given to us by Dickson, in 1814, and which he received from Swartz as *Jung. filicina* of his *Flor. Ind. Occid.* differs from the Hookerian species by the more crowded leaves, by their ventral margin being involute, by the more oblong stipules, by the greater size of the species, and by the more pectinate stems. Ours, again, differs from the plant of Swartz just alluded to, and which it more nearly resembles than *Jung. filicina*, Hook. by the less crowded though larger leaves, by the ventral margin presenting a remarkable *sinus* close to the lobule, and which makes the entire leaf recurved, by the shorter lobules and shorter stipules, whose margins are less recurved. It differs from both by the larger cells of the leaves.

14. Thysananthus, *Lindb.*

1. T. *scutellatus*, Tayl.; caule cæspitoso, adscendente, dichotomo, surculis erectis; foliis imbricatis, subpatentibus, convexis, oblongis, integerrimis, apice recurvis, basi sinuato-complicatis; lobulis rotundis involutis; stipulis subimbricatis, rotundatis; perichætii immersi foliis lateralibus subintegerrimis, ovato-lanceolatis, lobulis lanceolatis, stipularibus elongate obovatis, emarginato-bifidis; calyce axillari, oblongo, angulis integerrimis.

Hab. New Zealand. *Allan Cunningham, Mr. H. Watson's Herb.*

Patches wide, dark olive. Stems about 1 inch long. Leaves largely cellulose, closely imbricated, subdeflexed. Stipules scarcely twice as broad as the stems. The pale *perichætium* is quite concealed between the base of the calyx and the last pair of cauline leaves, and is not half of the length of the calyx; its lateral leaves are acute, the lobule acuminate. Nearly allied to our T. *anguiformis*, likewise from New Zealand; but distinguished by the

rounder lobules of the leaves, by the shorter perichætium, by its acuminate lobule, and by the angles of the calyx being entire.

2. T. *ophiocephalus*, Tayl.; caule subcæspitoso, procumbente, compresso, parce ramoso, per intervalla coarctato; foliis convexis, arcte imbricatis, patentibus, oblongis, integerrimis, apice rotundatis, recurvis, basi sinuato-complicatis; lobulis majoribus ovatis, involutis, extus unidentatis; stipulis laxe imbricatis, tenuissimis, rotundis, integerrimis, apice recurvis; perigoniis terminalibus, ovalibus.

HAB. Bay of Islands, New Zealand. *Dr. Sinclair.*

Patches reddish-brown. Stems more than 1 inch long, about one third of a line wide, lying nearly parallel, channelled above, annual prolongations narrowed at each end, so the stem appears here and there strangulated. Leaves closely imbricated even when wet, more patent than the lobules, which are large and tumid. Perigonial leaves short, obtuse, their lobules much inflated. No perichætia or calyces observed. The reddish colour, and the canaliculate and strangulated stems are very distinctive of this species.

15. PTYCANTHUS, *Nees.*

1. P. *mollis*, Hook. fil. et Tayl.; caule subdisperso, repente, vage subpinnato; foliis imbricatis, patentibus, rotundato-ovatis, obtusis, integerrimis, basi sinuato-plicatis; lobulo subquadrato basi involuto, apice adpresso; stipulis minoribus, rotundatis, integerrimis; calyce laterali, obovato, sursum 8-10-plicato, tubifero.

HAB. New Zealand. A morsel found on lichens, *Dr. J. D. Hooker*, 1844.

Stems brownish olive, flexuose, scarcely exceeding 3 lines in length. Leaves closely imbricated, tumid, soft, their cellules large and distinct, in outline like the opening of *Helix auricularia*, L. Stipules not imbricated. Perichætial leaves large, erect, very concave, the lateral angulato-rotundate, bilobate, the lesser lobe rounded at the top and separated by a very shallow notch, stipular leaf from a narrow base obo-

vato-rotundate. Calyx (only one was observed including a green capsule,) scarcely exserted, from a narrow base obovato-rotundate, smooth below, with 8-10 obtuse ribs above, topped by a narrow tube. The much smaller size, duskier colour, the leaves not apiculate, and obovate calyx, will readily distinguish this from Pt. *sulcatus*, Nees; whilst "the flat, distichous, obliquely ovate and acute leaves" of Pt. *retusus*, Nees, keep it apart from our plant.

2. Pt. *pycnocladus*, Tayl.; caule subcæspitoso, procumbente, ramoso, ramis brevibus, turgidis, adscendentibus; foliis imbricatis, erecto-patentibus, oblongis, subdecurvis, integerrimis, margine ventrali incurvo, lobulo ovato involuto; stipulis imbricatis subrotundis; calyce terminali, subexerto, subdecemplicato, tubo coronato.

HAB. On bark. Malacca. *Hook. Herb.*

Patches wide, dusky brownish-purple. Branches numerous, close, all pointing in the same direction, thick, obtuse. Leaves, when wetted, shining and patent; the perichætial pair with a *sinus*, bilobate, the stipular entire, oblongo-rotundate. The calyces become conspicuous by the expanding of the moistened leaves, they have about ten ribs, and a considerable tube above. Neither this nor the preceding species has the natural habit of the genus.

16. OMPHALANTHUS, *Lindb. et Nees.*

1. O. *gracilipes*, Tayl.; caule subdisperso, debili, procumbente, ramoso; foliis laxe imbricatis, patentibus, late oblongis, obtusis, integerrimis, lobulo ovato, tumido, involuto; stipulis majoribus, cordatis, sinuato-bifidis, segmentis integerrimis; calyce demum laterali, ex basi gracillima oblanceolato, lævi, inflato, quam perichætio triplo longiori, apice depresso, elongate tubifero.

HAB. Pacific Isles. *Nightingale, Hook. Herb.*

Patches loose and scattered among *Musci*, very pale or whitish-brown. Stems rather more than 1 inch long. Leaves but little imbricated, patent, or sometimes with their tops

deflexed, rounded or very obtusely angular, slightly convex, largely cellulose. The *apex* of the lobule lies adpressed upon the leaf, but its base is involute and tumid. Perichætial leaves smaller than the cauline, erect, adpressed to the slightly curved, slender base of the calyx. Tube of the calyx curved, conspicuous. This species has the habit of the European *Lejeunia serpyllifolia*, Libert; independently of its generic difference, the plant is browner, and has larger and more cordate stipules.

17. Phragmicoma, *Dumort.*

1. P. *plicatiscypha*, Hook. fil. et Tayl.; caule cæspitoso, adscendente subramoso; foliis imbricatis, patentibus, oblongis, obtusiusculis, apice recurvis; lobulis anguste ovatis, acutis, involutis; stipulis rotundatis, integerrimis; calyce terminali, immerso, obcordato, quadrangulo, angulis alatis, dentatis, tubo minuto coronato.

Hab. Bay of Islands, New Zealand. *Dr. Sinclair*, *Hook. Herb.*

Tufts loose, dusky green or brownish. Stems about ½ an inch high, reticulated with large distinct cells. Perichætial leaves similar to the cauline, but larger. Calyx half-immersed, having four wings, the two superior of which are the most considerable. This, in many respects, strongly resembles *Lejeunia applanata*, Nees; the lobules of the leaves, however, are more elongated and smaller, the cellules of the leaves are larger, whilst the compressed calyx more properly comes under the present genus.

2. P. *testudinea*, Tayl.; caule laxe implexo, procumbente, subramoso; foliis arctius imbricatis, patenti-recurvis, oblongis, obtusissimis, integerrimis, margine reflexis; lobulis lanceolatis, involutis, subunidentatis; stipulis minutis, rotundis, integerrimis.

Hab. On bark. Cincinnati, Ohio.

Patches thin, closely adpressed to the bark, whitish-green. Shoots linear, obtuse. Leaves singularly imbricated. Sti-

pules minute, compared with the size of the leaves. In *Ptycanthus sulcatus*, Nees, from Java, the leaves are far more distant, while their lobules are subrotund.

3. P. *cyclostipa*, Tayl.; caule implexo, procumbente vage ramoso, surculis compressis; foliis imbricatis patenti-recurvis, oblongis, obtusissimis, integerrimis; lobulis quadrato-ovatis, involutis, unidentatis; stipulis reniformi-rotundis, integerrimis; calyce terminali, subexerto, obcordato, compresso, supra plano, subtus ventricoso, quadrialato, alis ciliatis, ciliis dentatis.

Hab. On bark. Cincinnati, Ohio.

Patches very pale green, the older brownish, lying close to the bark. Stems about ½ an inch long. Perichætial leaves large, nearly covering the calyx, the lateral toothed, the stipular entire. Calyx crowned with a minute tube. This is far minuter and paler than P. *Mackaii*, Nees, while the fringed calyx is quite distinctive, and, indeed, more like that of *Lejeunia applanata*, Nees.

4. P. *baccifera*, Tayl.; caule subdisperso, planiusculo, elongato, procumbente, vage ramoso; foliis imbricatis, patentibus, oblongo-ovatis, integerrimis, apice recurvis, margine ventrali retiusculo, sinuato-plicato; lobulis minutis ligulatis subglobose involutis; stipulis majoribus, rotundo-reniformibus, imbricatis, subemarginatis; calyce laterali, compresso, oblongo, ore bilabiato, dentato; perichætiis minutis, foliis lateralibus bilobis, lobis subæqualibus, apice incurvis.

Hab. New Holland. *Hook. Herb.*

Pale olive. Stems 2-3 inches long, complanate; branches patent, few, the terminal shoot elongated. Leaves and stipules very thin and with large distinct cells. Leaves closely imbricated, flaccid; the minute lobule, when unfolded, ligulate, but in its natural involute state appearing spherical and opaque. Calyx lateral and nearly sessile, three times as high as the *perichætium*, whose leaves are very minute. Calyx rather concave on the upper side, convex on the lower, destitute of ribs, if a minute opaque mesial line on the upper side

be excepted. The singularity of New Holland plants attaches to this species of *Phragmicoma* in its curious lobules of the leaves. We have seen but two calyces, and these upon the same stem, yet one of them had the bilabiate mouth strongly and distinctly dentate, the other had it quite entire!

5. P. *ustulata*, Tayl.; caule implexo, nigrescente, procumbente, basi vage ramoso; foliis verticalibus, arcte imbricatis, erecto-patentibus, rotundato-ovatis, concavis, integerrimis, margine dorsali planiusculo, gibboso, ventrali recurvo; lobulis rotundatis, implicatis, crenulatis; stipulis obcordatis, lobis subemarginatis.

Hab. Philippine Islands. *Cuming, Hook. Herb.*

Patches wide, blackish when dry, when moist with a purple tint. Stems about 1 inch long, rather slender; branches irregular. Leaves with large cells at the base and the central parts. The fruit has not been observed. This may be compared with P. *polycarpa*, Nees; the leaves, however, are more erect, wider, and their central cellules much larger, the stipules so much emarginated as to be nearly obcordate. Dr. Montagne appears to have received a lichen from the Philippine Isles, gathered by Cuming, under the same n. 2188.

18. Lejeunia, *Gottsche et Lindb.*

* *Stipulis indivisis.*

1. L. *calyculata*, Tayl.; caule implexo, procumbente, subramoso; foliis patenti-recurvis, oblongis, obtusissimis, integerrimis, subdeflexis; lobulis involutis, lanceolatis; stipulis, rotundis, integerrimis; calyce demum axillari, subexserto, obcordato, quadrialato, alis integerrimis, tubo coronato.

Hab. On *Gyrophora spadochroa*, Ach., Laurel Mountain, Pennsylvania. *T. G. Lea, Hook. Herb.*

Patches minute, pale green. Stems scarcely 4 lines long. Leaves loosely imbricated, their margins when dry recurved.

Perichætial leaves nearly as long as the calyx, erect, narrow, acute; a pair of annotinous shoots issue from beneath the calyx. This is allied to our *Phr. microscypha*, from St. Helena; it is, however, a smaller and paler plant, and has the leaves more patent; besides, the calyces are not lateral as in that species.

2. L. *adglutinata*, Tayl.; caule disperso, repente, adnato, vage ramoso, surculis complanatis; foliis laxe imbricatis, patentibus, recurvis, acinaciformibus, obtusis, margine denticulato; lobulis dimidiato-ovatis inflexis; stipulis tenuissimis, minutis, rotundatis, denticulatis, apice fissis.

HAB. Cayenne. *Richard, Hook. Herb.*

Patch dark brown. Stems 1-2 inches long; branches short. Leaves loosely imbricated, flaccid, their cellules towards their bases very large; the dorsal margin is more curved than the ventral. Stipules very thin, so as to be inconspicuous. It is allied to L. *tortuosa*, L. et L., but the bifid stipules and more minutely denticulate leaves, readily distinguish it. Perhaps it were better placed in the next section.

3. L. *Dominghensis*, Tayl.; caule implexo, repente, vage ramoso; foliis imbricatis, erecto-patentibus, oblongis, apice subdeflexis, rotundatis, integerrimis, basi sinuato-complicatis; lobulis late ovatis, obtusissimis, inflexis; stipulis rotundatis, apice reflexis, integerrimis; perichætii foliis lateralibus bilobis, lobis acuminatis, stipulari bifido; perigoniis terminalibus; calyce in ramulo terminali, immerso, subsphærico, apice corrugato.

HAB. St. Domingo; n. 38. *Hook. Herb.*

Patches dusky yellowish-olive. Stems about 1 inch long, scarcely pinnate. Leaves closely imbricated. Lobules with inflexed, obtuse tops, pointing rather towards the stems. *Periyonia* ovato-lanceolate. Calyx obovato-rotundate, the *laciniæ* of the mouth apiculate. *Perichætia* large, concealing the calyx, their leaves bilobate; the lobule acuminate and nearly as long as the greater lobe. This may be known from the succeeding species by the lobules of the leaves pointing

inwards towards the stems, and by the acuminate lobules of the perichætial leaves.

4. L. *linguæfolia*, Tayl.; caule implexo, repente, vage ramoso; foliis arcte imbricatis, patenti-recurvis, oblongis, apice deflexis, concavis, integerrimis, basi sinuato-complicatis; lobulis subrotundis, involutis, subdenticulatis; stipulis rotundatis, subemarginatis, integerrimis; calyce axillari, immerso, obovato, subcompresso, dorso uniplicato, carina triplicata, tubo minuto coronato.

HAB. St. Thomas. *Richard, Hook. Herb.* 1814.

Patches, when dry, very dark brown; when wet, brownish-olive. Stems about 1 inch long. Leaves soft; lobules involute, ovato-lanceolate, but when expanded artificially, quadrato-rotundate, crenulate. *Perichætia* nearly covering the calyx, their lateral leaves with a shallow *sinus* dividing the two lobes, of which the lesser is acute, the greater rotundate; stipular leaf emarginato-bifid. *Perigonia* in the course of the shoots, linear; anthers minute, reddish-brown. This has a more compressed calyx than the preceding.

5. L. *polyphylla*, Tayl.; caule cæspitoso, adscendente, vage subpinnato; foliis verticalibus, imbricatis, concavis, late dimidiato-cordatis, integerrimis; lobulis involutis lanceolatis, apice folio incumbentibus, crenulatis; stipulis minutis, reniformibus, amplexantibus, integerrimis; calyce immerso, rotundato obovato, sursum 5-6-cristato, cristis subdenticulatis, ore minutissime tubifero.

HAB. Cincinnati. *Hook. Herb.*

A minute patch only was observed, apparently taken off of bark; olive-coloured. Stems scarcely 4 lines long. Leaves largely cellulose. Calyx terminal on short branches, whose leaves are in a rapidly increasing series; it is quite concealed in the *perichætium*, whose leaves are very wide and erect, and whose lobule is oblong, obtuse, or rounded. Capsule sphærical, split down nearly to the base, the *laciniæ* reflexed. The leaves are wider and rounder than in *Phr. versicolor*, L. et L., and more largely cellulose; the denticulate crests of the

calyx are very distinctive. It may be observed that in the *Synopsis Hepaticarum*, p. 297, under *Phragmicoma versicolor*, L. and L., are given "*Jung. auriculata.* Wils. MSS." and "*Phragmicoma spathulistipa*, var. β, Nees in Herb. Wight (an species distincta)?" These two, however, appear to be distinct species; for the former has the leaves more closely imbricated, longer, deflexed, and their cellules far more minute. It is uncertain which of the two is described in the Synopsis.

6. L. *eulopha*, Tayl.; caule disperso, procumbente vage ramoso; foliis imbricatis, patentibus, oblongis, apice recurvis, integerrimis; lobulis involutis, ovatis, acutis, apice folio incumbentibus; stipulis majoribus late rotundatis, integerrimis; foliis perichætialibus anguste oblongis acutiusculis, stipulari majori, omnibus recurvis, dentatis; calyce terminali, oblongo-obcordato, quadrialato, alis cristatis, cristis pinnatifido-dentatis.

HAB. Pacific Isles. *Nightingale, Hook. Herb.*

Patches very loose, creeping among *Musci*, brown, turning white when old. Stems 1-2 inches long; shoots complanate. Lobule of the leaf inflexed and tumid next to the stem, but exteriorly lying flat on the leaf, as in certain *Radulæ*. *Perichætia* terminal, large, the lobule subulate and acuminate. This may be compared with *Jung. transversalis*, Sw.; it is, however, a smaller plant, with leaves wider at their summits, and the calyces have more compound crests.

7. L. *tenuifolia*, Tayl.; caule laxe implexo, procumbente, vage ramoso; foliis laxius imbricatis, patentibus, tenuibus, ex angusta basi rotundatis, integerrimis, margine subflexuosis, basi sinuato-complicatis, decurrentibus; lobulis subquadratis, inflexis, unidentatis; stipulis majoribus, subrotundis, margine subundulatis, integerrimis; perigoniis lateralibus, sessilibus, minutis, surculo angustioribus, brevibus, ovato-linearibus, obtusis.

HAB. On *Musci*, Casapi. *Mathews, Hook. Herb.*

Patches loose, dusky olive-green. Stems about 1 inch long; branches few, irregular in length. Leaves flattish,

thin, their central cellules large. This resembles our *Phragmicoma cyclostipa*, but the shoots are more elongated, the leaves less imbricated, thinner, their margins more waved, and their figure more round.

8. L. *Malaccensis*, Tayl.; caule implexo, procumbente, vage subpinnato; ramis rectiusculis; foliis arcte imbricatis, verticalibus, erecto-patentibus, mollibus, concavissimis, stipulisque obovato-rotundatis, integerrimis, margine tumenti-inflexis; lobulis minutis, ovatis, obtusissimis, involutis; calyce terminali, immerso, obovato, supra compresso, concavo, biplicato, infra ventricoso-carinato, carina 3-angulata.

HAB. On bark. Malaccas. *Hook. Herb.*

Patches several inches wide, dark purplish-brown, somewhat shining when wet. Stems 1-2 inches long. Stipules imbricated. Margins of the perichætial leaves inflexed. We know not one of the *Lejeuniæ* with entire stipules to be compared with the present for the very remarkably broad incurvation of the ventral margin of its leaves; nor have any the cells so small, compared with the size of the plant.

9. L. *repleta*, Tayl.; caule cæspitoso, erecto, apice subincurvo, vage ramoso; surculis adscendentibus, utrinque attenuatis; foliis arcte imbricatis, acinaciformibus, apice oblique truncatis; lobulis subquadratis, involutis; stipulis obovato-cordatis, margine recurvis; perigoniis quam surculis latioribus atque in surculos abeuntibus; calyce axillari, subexserto, obovato, supra compresso, concavo, subtus obtuse carinato, ore tubifero.

HAB. Madras. *Dr. Wight*, *Hook. Herb.*

Tufts dense, wide, blackish-brown. Stems 1-2 inches high. The *perigonia* occur in the course of the shoots, their leaves have large ventricose bases. Stipules oblong, with an obtuse notch. Lateral perichætial leaves acute. This resembles *Jung. hians*, Lehm. MSS. in *Hook. Herb.*, from which it may be known by the obliquely truncate leaves, and by the lobule being larger and more acuminate, as well as by its darker colour and finer shoots. From *Ph. bicolor*, Nees, it

is distinguished by the far denser structure of the leaves, which too, are longer, while the stipules are smaller.

** *Stipulis divisis.*

10. L. *decora*, Tayl.; caule implexo, prostrato, subramoso; foliis approximatis, subpatentibus, obovatis, apiculatis, dentatis; lobulis minutis, rotundato-ovatis; stipulis cordatis, bifidis; calyce demum axillari, oblongo-obcordato, spinoso-dentato.

HAB. Dominica. *Hook. Herb.*

Patches scattered, pale olive-green. Stems scarcely half an inch long. Leaves loosely imbricated, rather flaccid, and flexuose, obtuse, yet with a sudden subulate *apiculus*, or large tooth. Perichætial leaves patent, their lobule ligulate, obtusely emarginate, the stipular oblong, bifid, denticulate. Calyx exserted. This, perhaps, may be compared with *Lejeunia axillaris*, Nees, having the calyx very similar, and the leaves dentate, but the bifid stipules and obtuse and apiculate leaves are abundant marks of difference.

11. L. *crucianella*, Tayl.; caule sparso, exili, procumbente, subramoso; foliis laxis, erecto-patentibus, ovato-lingulatis, apice tridentatis, dentibus divaricatis; lobulis involutis ovatis, longius unispinosis; stipulis minutis, bipartitis, segmentis linearibus, divaricatis; perigoniis majoribus, terminalibus, ovato-lanceolatis.

HAB. On *Jung. Boryana*, Sw. Demarara.

Inconspicuous, pale, scattered; stems scarcely 1 line long. Remarkable in the genus for the cruciform summits of the leaves, and singular in the elongate spine of the lobule.

12. L. *lyratifolia*, Hook. fil. et Tayl.; caule minuto, tenui, subdisperso, procumbente, vage ramoso; foliis laxis, patentibus, subquadratis, angulo antico exteriori producto; lobulis oblongis, involutis; stipulis bipartitis, segmentis lanceolatis, divaricatis; calyce axillari, ex angusta basi obovato, quadrialato, tubifero.

HAB. On *Parmelia diatrypa*, Ach. Van Diemen's Land.

Patches very loose, very pale brownish-olive. Stems

scarcely 3 lines long; branches few, irregular. Leaves harp-shaped, their outer margin recurved. *Perigonia* in short terminal spikes. *Perichætia* of a pair of erect leaves, with unequal acute segments, and an oblong bifid stipular one. Calyx exserted for half its length. Allied to *Lej. hamatifolia*, Nees; yet the acumination of one angle of the leaf is far shorter, and the leaves more patent and less imbricated.

13. L. *capulata*, Tayl.; caule disperso, exiguo, procumbente, vage ramoso; foliis laxis, subpatentibus, lanceolatis, acuminatis, margine ventrali ante lobuli ovati involutionem unispinosis, cæterum subintegris, stipulis minutissimis, bipartitis, segmentis setaceis, divaricatis; perichætiis lateralibus, eorum foliis bilobis, lobis erectis, stipula oblonga bifida.

Hab. On a dicotyledonous leaf, accompanied by L. *tortuosa*, L. et L. Oware. *Palisot de Beauvois*.

Patches minute, inconspicuous, pale brown. Stems 1-2 lines long. Leaves appear twisted outwards, while the lobule is involute. *Perichætia* longer than the leaves, sessile, the base attenuated. *Perigonia* are filiform, terminal spikes; their leaves not one quarter of the size of the cauline. It is far more minute than L. *hamatifolia*, Nees; its leaves are more truly lanceolate and have each a curious single, spinous tooth near to the lobule, like the hilt of a dagger.

14. L. *heterocheila*, Tayl.; caule implexo, elongato, procumbente, subramoso; ramis complanatis; foliis subimbricatis, patentibus, oblongo-ovatis, apiculatis, apice subdentatis, margine subflexuosis; lobulis minutis, subquadratis, inflexis; stipulis majoribus, cordatis, bifidis, integerrimis.

Hab. On Pichincha. *Prof. W. Jameson, Hook. Herb.*

Patches pale olive. Stems 2-3 inches long, one-twentieth of an inch wide. Leaves with their bases imbricated. Stipules four times as wide as the stems. This has all the habit of L. *languida*, Mont. et Nees; the bifid stipules at once distinguish them.

15. L. *longiuscula*, Tayl.; caule implexo, debili, elongato, subsimplici, subflexuoso; foliis imbricatis, erecto-patenti-

bus, flaccidis, curvato-ovatis, acutis, subunidentatis, margine exteriori incurvo; lobulis minutis, involutis; stipulis majoribus, rotundato-oblongis, bifidis, margine inflexis, integerrimis.

HAB. Corcovado, near Rio Janeiro. *Mr. Bunbury, Hook. Herb.*

Pale olive; branches few, elongated. Stipules more than half of the size of the leaves; cellules of both large and distinct. Allied to the preceding, but the leaves are more erect, shorter and more entire, whilst the stipules are far larger and more oblong.

16. L. *cordifissa*, Tayl.; caule implexo, procumbente, vage ramoso, foliis subimbricatis, patentibus, oblongis, acuminulatis, convexis, celluloso-crenulatis; lobulis minutis, subrotundis, involutis; stipulis majoribus, rotundato-cordatis, apice fissis, celluloso-crenulatis.

HAB. Demarara, *C. S. Parker*. Forest of Esmeraldos, *Prof. W. Jameson.*

The described specimens were collected by Professor Jameson. Patches wide, sordid green. Stems 1-2 inches long. Leaves loosely imbricated, their tops recurved and acuminulate. Exceedingly like L. *sordida*, Nees, from Java, from which ours may be known by the more imbricated leaves, by their crenulated margins, and greater size of the stipules.

17. L. *epitheta*, Tayl.; caule sparso, repente, adpresso, vage ramoso; surculis complanatis; foliis laxis, erecto-patentibus, ex angusta basi dimidiato-ovatis, acutis, dentatis; lobulis ovato-lanceolatis, involutis; stipulis minutis, bipartitis, segmentis subulatis, divaricatis; perigoniis terminalibus, linearibus, obtusis.

HAB. On a dicotyledonous leaf. West Indies, *M. Coulon, Hook. Herb.* 1814.

Pale brown. Stems about ½ an inch long. Leaves rather distant, the base narrow, slightly twisted, dorsal margin gibbous, ventral nearly straight. Allied to L. *lunulata*, Nees, but the leaves are acute and more strongly dentate.

18. L. *Lyncei,* Tayl.; caule sparso, repente, subsimplici; foliis laxis, erecto-patentibus, lingulatis, subacutis, complanatis, integerrimis; lobulis minutis, ovatis, involutis; stipulis nullis.

Hab. On *Diplazium Fraterni, Presl.* Martinique, *Dr. Greville's Herb.*

Stems pale green, scarcely 1 line long; the leaves as well as the stems sending out fibres terminated by wide discs, by which they radicate. Cellules of the leaves large. In some respects it is allied to L. *microscopica,* Tayl. but the leaves are flat, slightly incurved forwards, and so remind one of the habit of *Schistostega osmundacea,* Mohr.

19. L. *longiflora,* Tayl.; caule implexo, procumbente, vage ramoso; surculis subflexuosis, complanatis; foliis tenuissimis, imbricatis, patentibus, oblongis, apice rotundatis, integerrimis; lobulis minutis, ovatis, subunidentatis, involutis; stipulis rotundatis, planis, apice fissis, subbidenticulatis; calyce laterali, sessili, subnudo, ex angusta basi obovato, quinquealato, alis subintegris, apice tubifero.

Hab. Cincinnati, Ohio. *Hook. Herb.*

Patches pale dusky-olive. Stems about 1 inch long. Monoicous. Perigonial spikes at the base or in the course of the shoots. *Perichætia* minute, their leaves erect, scarcely larger than the cauline, the stipular obovato-rotundate, split at the top, the lateral subacute. Stipules rather large. Cells of both leaves and stipules sometimes with an irregular series of minuter cellules around their circumference. From *Jung. tabularis,* Sprengel, ours may be known by its more obtuse and more imbricated leaves, and by its larger stipules, which are simply split above, but have no divaricating segments.

20. L. *polyploca,* Tayl.; caule cæspitoso, adscendente, ramoso; foliis imbricatis, patentibus, oblongis, acutiusculis, apice recurvis, integerrimis; lobulis ovatis, erecto-patentibus, subunidentatis; stipulis majoribus late cordatis, breviter emarginatis, integerrimis; foliis perichætialibus elon-

gatis, convolutis; calyce ramulum terminante, anguste obovato, sursum 5-plicato, ore minuto; perigoniis lateralibus, breviter spicatis, obtusis.

HAB. Pacific Isles, *Nightingale, Hook. Herb.*

Tufts wide, dense, olive-brown. Stems scarcely 1 inch long, much branched. Margins of the stipules flexuose. Barren *perichætia* erect, cylindrical. In L. *trifaria*, Nees, the leaves are not so long, have no acute point, and the cells are far larger.

21. L. *repens*, Tayl.; caule implexo, procumbente, subpinnato, flexuoso; ramis brevibus; foliis imbricatis, patenti-recurvis, oblongis, obtusissimis, margine subundulatis; lobulis minutis, triangularibus, subunidentatis, involutis; stipulis rotundatis, convexis, apice fissis; calyce laterali, oblongo-obovato, quinquealato, tubifero; perigoniis spicatis, sessilibus.

HAB. Demarara. *Greville's Herb.*

Patches wide, olive-brown. Stems 2-3 inches long, often with very short branches. Monoicous. *Perigonia* linear, lateral. *Perichætia* on short branches. This is larger than our L. *longiflora*, the leaves are more distant, more patent, and more undulate, their lobules are more minute, the calyces are not so narrow at their bases, and the *perigonia* do not occur in the course of the shoots, but form lateral spikes. This is quoted in Synopsis Hepat. p. 364, under L. *elegans*, Gottsche, a plant, as it would appear, whose locality and fructification are unknown; but whatever be Dr. Gottsche's species, ours seems to differ from it, if we may judge from the characters assigned to it, by the branches not being fascicled, by the recurved leaves, by the stipules being contiguous but scarcely imbricated, and less than half the size of the leaves, whilst their lobes are not acute.

22. L. *Vogelii*, Tayl.; caule cæspitoso, adscendente, subramoso; foliis laxis, erecto-patentibus, ex angusta basi obovatis, integerrimis; lobulis subnullis; stipulis minutis, cordatis, bifidis; calyce laterali, elongato-obovato, sursum subplicato, tubifero.

HAB. Maritime rocks. Niger expedition. *Vogel. Hook. Herb.*

Tufts extensive, flat, olive-green. Stems 3-4 lines long, very slender. Leaves rather flaccid, largely cellulose, their lobule inconspicuous. Stipules scarcely wider than the stems. Perichætial leaves similar to the cauline. *Perigonia* terminal. Calyx twice as long as the leaves. In *Jung. tenera*, Sw. the leaves are much larger, more distant, and attached with a wider base.

23. L. *tenella*, Tayl.; caule subdisperso, procumbente, subramoso; surculis elongatis, subsimplicibus; foliis imbricatis, erecto-patentibus, concavis, rotundato-quadratis, margine recurvis, integerrimis; lobulis erectiusculis, ovatis, involutis, subunidentatis; stipulis majoribus, rotundato-ovatis, bifidis, segmentis subacutis.

HAB. On *Dicranum fragile*, Hook. Sincapore. *Wallich.*

Patches loose, pale yellowish-olive. Stems about 1 inch long, fine as human hair, when dry appearing nodulose. A single calyx was observed; it was obovate, 5-angled above, and crowned with a minute tube. Ours differs from L. *æmula*, Gottsche, by the less concave and less patent leaves, and by the larger stipules with wider segments.

24. L. *punctiformis*, Tayl.; caule exili, sparso, procumbente, subramoso; foliis distantibus, erectis, ovatis, obtusissimis, concavissimis, integerrimis; lobulis subæqualibus, ovatis, involutis; stipulis minutis, bipartitis, segmentis linearibus, acutis.

HAB. East Indies. *Dr. Wight. Dr. Greville's Herb.*

Stems inconspicuous without a lens; scarcely 1 line long. Leaves alternate, distant, erect or nearly adpressed to the stem, like little spherules with the side next to the stem cut to admit the involute lobules. This approaches our L. *bullata*, likewise a tropical plant; the leaf, however, is more spherical, the lobule quite as long, and the plant is larger.

25. L. *bullata*, Tayl.; caule exili, sparso, procumbente, subramoso; foliis subapproximatis, erectiusculis, ovatis, rotundatis, concavissimis, integerrimis; lobulis latis, ovatis,

involutis, unidentatis; stipulis minutis, bipartitis, segmentis linearibus, divaricatis; calyce demum laterali, obovato, angulato, tubifero.

HAB. On bark. St. Vincent's. *Rev. L. Guilding.*

Has all the habit of the preceding, differing by the ear-shaped leaf, the shorter unidentate lobule and minuter size.

26. L. *lucens*, Tayl.; caule laxe implexo, procumbente, vage ramoso; foliis distantibus, erecto-patentibus, elongate ovatis, obtusis, integerrimis; lobulis ovatis, unidentatis, involutis; stipulis minutis, bipartitis, segmentis linearibus, divaricatis.

HAB. Cincinnati, Ohio. *Hook. Herb.*

Whitish-green. Stems about 3 lines long. The leaves are more distant and more obtuse, the lobules larger, the segments of the stipules more linear than in L. *ovata*, Tayl.

27. L. *albifolia*, Tayl.; caule sparso, repente, adpresso, vage ramoso; surculis complanatis; foliis imbricatis, patenti-recurvis, late rotundatis, integerrimis; lobulis ovatis, bidentatis, involutis; stipulis minutis, bipartitis, segmentis divaricatis; calyce laterali, oblongo, apice 4-plicato.

HAB. On leaves. Oware. *Palisot de Beauvois.*

A very minute patch only was observed. Stems about ½ inch long, and ½ line wide. Leaves pellucid, very thin; the lobule is scarcely involute though tumid. *Perichætia* very short. *Perigonia* lateral, ovate, obtuse. Differs from our L. *epitheta* by the entire leaves and bidentate lobule.

28. L. *microloba*, Tayl.; caule implexo, procumbente, basi vage ramoso; surculis elongatis, subsimplicibus; foliis contiguis, patentibus, oblongis, subacutis, integerrimis, apice recurvis; lobulis minimis, lanceolatis, involutis; stipulis majoribus, cordatis, bipartitis, segmentis lanceolatis, integerrimis; calyce ramulum terminante, ex angusta basi oblanceolato, tumido, retuso, apice subplicato.

HAB. South Sea Isles. *Nightingale, Hook. Herb.*

Tufts brownish. Stems rarely 2 inches long. Lobes of the perichætial leaves twisted, the stipular sinuato-bipartite. The large leaves and stipules, compared with the inconspicuous lobule, render this species singular.

29. L. *Drummondii*, Tayl.; caule implexo, vage pinnato, repente; foliis arcte imbricatis, erecto-patentibus, oblongis, obtusiusculis, integerrimis, apice recurvis, basi sinuato-complicatis; lobulis ovatis, involutis, subdecurrentibus; stipulis parvis, rotundis, bifidis; calyce laterali, oblanceolato, quinquealato, tubifero; perigoniis lateralibus, rotundis, quam foliis minoribus.

HAB. Swan River. *Mr. James Drummond.*

Pale straw-coloured. The leaves are longer and more acute than in L. *contigua*, Nees.

30. L. *comitans*, Hook. fil. et Tayl.; caule implexo, procumbente, vage subramoso; surculis sursum incrassatis; foliis imbricatis, tumidis, patentibus, oblongis, acutiusculis, apice recurvis, integerrimis; lobulis ovatis, inflexis, subunidentatis; stipulis minutis, incontiguis, rotundatis, bifidis; calyce axillari, subexserto, obcordato, triquetro, tubifero.

HAB. Accompanied by *Ptycanthus mollis*, Tayl., from New Zealand.

Pale olive. Stems scarcely 2 lines long. Leaves minutely cellulose, closely imbricated. Calyx flat above, with a single wide keel below. This, too, bears much resemblance to L. *contigua*, Nees; but the calyces are not quinquangular, and the leaves are longer and more acute.

19. FRULLANIA, *Raddi.*

1. F. *neurota*, Tayl.; caule sparso, procumbente, subbipinnato; foliis imbricatis, patentibus, rotundato-ovatis, apice recurvis, integerrimis, basi in auriculas galeiformes, subcompressas, majores sinuato-complicatis; stipulis rotundato-ovatis, emarginato-bifidis, mediotenus uninerviis subtus radicantibus; calyce terminali, oblongo, supra planiusculo, subtus bicarinato, ore tubifero.

HAB. On *Parmelia furfuracea*, Ach. Nepal. *Wallich.* 1820.

Purplish-brown. Stems 1-2 inches long. Leaves closely imbricated; the auricles of those near to the *perichætium* expanded into an acutely triangular shape. Stipules wider than

the stems, their notch very shallow, the nerve at the base very conspicuous, by which character this species differs from F. *Ecklonii*, Spreng., as well as by the entire perichætial leaves.

2. F *polyptera*, Tayl.; caule sparso, repente, vage pinnato, foliis laxiusculis, patentibus, rotundato-ovatis, convexis, obtusiusculis, integerrimis, apice recurvis; auriculis galeiformibus, minutis; stipulis ovatis, bifidis, segmentis acutis; calyce in ramis brevibus terminali, obovato septangulari, angulis denticulatis, ore contracto, tubo brevi coronato.

HAB. On *Parmelia furfuracea*, Ach. Nepal. *Wallich.* 1820.

Purplish-brown. Stems 1-2 inches long; branches short, patent. Auricle of the leaf sub-hemispherical, exteriorly unidentate. Stipules nearly bipartite, narrow. Auricle of perichætial leaves incurved and laciniated. Calyx oblong, with at least seven wings. Pedicel short, greenish-white. Capsule globose. From F. *squarrosa*, Nees, the present differs not only by the narrow, nearly bipartite stipules, whose segments are entire, but likewise by the plurialate calyx.

3. F. *Drummondii*, Tayl.; monoica; caule sparso, procumbente, subpinnato; foliis laxe imbricatis, patentibus, oblongis, obtusis, integerrimis; auriculis galeiformibus, decurvis; stipulis minutis, oblongis, bifidis; foliis perichætialibus unidentatis; calyce majori, ex angustiori basi ovato, apice retuso, tubifero; perigoniis in ramis brevissimis terminalibus, rotundis.

HAB. On bark. Louisiana. *J. Drummond.*

Patches scattered, minute, reddish-brown. Stems about 3 lines long, very slender. Leaves largely and distinctly cellulose. Stipules scarcely wider than the stems. Perichætial leaves recurved, obtuse yet apiculated with a single tooth; the stipular much shorter, its segments lanceolate. Allied to our F. *fragilifolia*, but the leaves are destitute of moniliate cells, the calyx is much larger in proportion to the stems, the auricles are curved down, and the perichætial leaves are unidentate.

4. F. *probosciphora*, Tayl.; caule implexo, procumbente, subpinnato; foliis imbricatis, semiverticalibus, patentibus, subplanis, rotundatis, integerrimis, caulem processu rotundato, incurvo transeuntibus; auriculis majoribus, galeiformibus, folii margine inclusis; stipulis obovatis, bifidis, segmentis subtruncatis, obtuse dentatis; calyce terminali, lineari-oblongo, plicato, tubifero.

HAB. On bark. Van Diemen's Land. *Gunn.* 1832.

Patches minute, pale olive-green. Stems 1 inch long; branches short, patent. Leaves, when moistened, rising up into a semivertical position, slightly concave; on the upper surface each leaf crosses the stem by a flat, round, incurved process, which thus embraces the stem. Perichætial leaves round, recurved, the auricle erect, lanceolate, toothed on the interior margin; the stipular lanceolate, bifid, the segments dentate. Calyx conspicuous, having several longitudinal plaits, especially on the inferior side. Differs from F. *squarrosula*, Tayl., from New Zealand, by the less imbricated leaves, the longer auricles, by the subdentate segments of the stipules, and by the more oblong and more ribbed calyx, whose tube at its mouth is longer.

5. F. *microscypha*, Tayl.; caule implexo, procumbente, vage ramoso; foliis imbricatis, patentibus, subrotundis, concavis, integerrimis; auriculis galeiformibus folii partem tertiam æquantibus; stipulis minutis, bifidis, segmentis ovatis, acutis; calyce terminali, rotundato-obcordato, sursum alato, tubifero, perichætium superante.

HAB. On bark. North America. *J. Drummond. Hook. Herb.*

Patches small, dark purplish-brown. Stems scarcely exceeding 3 lines in length. Leaves in an increasing series to the top of the stem. Differs from F. *fragilifolia*, Tayl., by the perichætial leaves being entire, and by the short calyx, winged above.

6. F. *pentepleura*, Tayl.; caule implexo, prostrato, ramoso, sursum incrassato; foliis verticalibus, imbricatis, rotundato-ovatis, integerrimis; auriculis majoribus, galeiformibus; stipulis minutis, ovatis, bifidis; calyce terminali ex an-

gusta basi obcordato, compressiusculo, sursum quinquicostato; foliis perichætialibus rotundatis auriculis oblongis, intus laciniam subulatam ferentibus; perigoniis oblongis.

Hab. Swan River. *Mr. James Drummond.*

Tufts in flattish cushions, very dark purple. Stems 3-4 lines long. Auricles of the leaves sometimes hypertrophied. Stipules not wider than the stems. From F. *dilatata*, Nees, the smooth calyx and from F. *fragilifolia*, Tayl. the oblong *perigonia* keep the present very distinct, whilst the 5-ribbed calyx separates it from our F. *læviscypha.*

7. F. *læviscypha*, Tayl.; caule exiguo, implexo, prostrato, subpinnato; foliis imbricatis, patentibus, margine recurvis, integerrimis; auriculis galeiformibus; stipulis minutis, obovatis, bifidis, utrinque unidentatis; calyce demum axillari, obcordato, lævi, tubifero.

Hab. On bark. n. 104. Columbus, Ohio. *W. S. Sullivant.* n. 150. Cincinnati. *Lea. Hook. Herb.*

Patches 2-3 inches wide, dark brownish-olive. Stems ½ an long. Leaves loosely imbricated, convex. Stipules not wider than the stems. Perichætial leaves roundish-egg-shaped, entire, their auricle having interiorly a single subulate spine; the stipular oblong, acute, bifid, subdentate. Calyx plane above, with a single tumid keel below. From F. *fragilifolia*, Tayl., the present may be known by the perichætial leaves being entire; whilst all the leaves are more minutely and delicately cellulose.

8. F. *macularis*, Tayl.; caule implexo, repente, subpinnato; foliis subimbricatis, patentibus, oblongis, obtusis, integerrimis; auriculis galeiformibus, decurvis; stipulis minutis, ovatis, apice fissis, integerrimis; calyce terminali oblongo-obcordato, supra plano, lævi, subtus unicarinato, tubifero; foliis perichætialibus oblongo-rotundatis, auriculis acutis, stipulari bifido, segmentis acuminatis.

Hab. On bark. St. Vincent's. *Rev. L. Guilding.*

Patches 1-2 inches wide, purplish-brown. Stems scarcely 3 lines long. Auricles of the leaves close to the stem, their

decurved mouths pointing outwards, and reaching below the ventral margins of the leaves. Fissure of the stipules close, inconspicuous. Calyx three times as high as the *perichætium*. This differs from our F. *microscypha* by the smaller size, the more minute cells of the leaves, by the acute *sinus* of the stipules, and by the acuminate auricles of the perichætial leaves.

9. F. *nana*, Tayl.; caule subdisperso, repente, vage ramoso, ramis gracillimis; foliis subimbricatis, patentibus, rotundato-oblongis, integerrimis, obtusissimis; auriculis galeiformibus folii partem tertiam æquantibus; stipulis minutis, ovatis, bifidis; perigoniis late linearibus; calyce majori, terminali, obcordato, compresso, lævi, angulis sursum subscabris, ore tubifero.

HAB. Lake Superior, N. America; on *Neckera pumila*, Hedw. *Dr. Greville's Herbarium.*

Inconspicuous, very pale green. Stems scarcely 2 lines long. Perichætial leaves nearly round, their auricles lanceolate with the margins reflexed, interiorly having a minute spine. Both *perigonium* and *calyx* large in proportion to the stems and leaves. It is far more minute than F. *Atchafalagæ*, Hampe, and has the leaves more distant, with smaller cellules, and the segments of the stipules entire.

10. F. *megalocarpa*, Tayl.; caule sparso, procumbente, laxe bipinnato, ramis gracillimis; foliis imbricatis, patentibus, oblongo-ovatis, acutis, recurvis, integerrimis; auriculis clavato-oblongis, cauli paralellis, stylo subuliformi interjecto; stipulis minutis, bifidis; perigoniis rotundatis, sessilibus; calyce majori, ramulum terminante, oblongo, supra planiusculo, subtus obtuse carinato, tubifero.

HAB. On *Musci*. Van Diemen's Land. *Dr. Greville's Herb.*

Minute, scattered, brown. Diœcious. Stems scarcely 1 inch long. Shoots of equal breadth. Both *periyonia* and *calyces* large in proportion to the shoots. It is more minute and slender than F. *exilis*, Tayl. from Demerara, and readily distinguished by the style interposed between the auricle and the stem.

11. F. *diplota*, Tayl.; caule exiguo, rufescente, implexo, procumbente, subbipinnato, pinnulis laxis; foliis laxe imbricatis, patentibus, amplexantibus, subquadrato-rotundatis, integerrimis, apice subrecurvis, margine dorsali gibboso; auriculis ex angusta basi oblongis, obliquis, ultra folii basin demissis, stylo breviori lanceolato interjecto; stipulis distantibus rotundato-ovatis, bifidis, integerrimis.

HAB. On *Parmelia sulcata*, Tayl. Interior of New South Wales. *R. Cunningham*, 1836. *Hewett Watson, Esq.*

Stems about 4 lines long. Leaves very thin. The style between the stem and the auricle is scarcely more than half as long as the latter. The cells of the leaves near their junction with the stem are much larger than elsewhere. This is more minute than the Europæan F. *fragilifolia*, Tayl., the absence of moniliate opaque cells in the leaves and the double auricles at once distinguish them.

12. F. *ulotricha*, Tayl.; caule cæspitoso, adscendente, subpinnato; ramis brevibus; foliis imbricatis, patentibus, oblongo-ovatis, obtusis, convexis, apice recurvis, integerrimis; auriculis cylindraceis, cauli adpressis, folio inclusis; stipulis oblongo-ovatis, emarginato-bifidis, segmentis acutis, conniventibus, margine incurvis; foliis perichætialibus erectis, ovalibus, acutis, dentatis, eorum auriculis folioque stipulari 3-4-fidis, elongate ciliatis, ciliis crispis; calyce majori, exserto, oblongo, triquetro, nitido, tubifero.

HAB. South America; n. 102. *Humboldt, Hook. Herb.*

Tufts several inches wide, purplish-black, somewhat shining. Stems 2-3 inches long. Leaves oblong, patent or deflexed. Auricle narrower above, bulging below, slightly curved, not passing down below the margin of the leaf. Stipules closely adpressed to the stems. The elongated, numerous, crisped *ciliæ* of the auricle and stipule of the *perichætium* separate this species from its congeners.

13. F. *exilis*, Tayl.; monoica; caule implexo, procumbente, subbipinnato; ramis gracilibus, recurvis; foliis imbricatis, erecto-patentibus, oblique ovatis, obtusis, apice minute

unidentatis, basi grosse cellulosis; auriculis late clavatis, plurimis explanatis, lanceolatis; stipulis late obovatis, subdecurrentibus, bifidis, basi uninerviis; perigoniis terminalibus, subrotundis, laxius imbricatis; foliis perichætialibus basi connexis, subdentatis, obovatis, apiculatis; calyce terminali, ex angusta subexerta basi obovato, obtuso, plicato, tubifero.

HAB. On *Hepaticæ.* Demerara. *Dr. Greville's Herb.*

Brownish-olive. Stems about 1 inch long, regularly pinnate above. Stipules scarcely entire. Capsule subrotund. Differs from small varieties of F. *Tamarisci,* Nees, by the spurious nerve at the base of the leaves, the more obtuse perichætial leaves, the *perigonia* at the extremities of more considerable branches, and the larger and more exserted calyx.

14. F. *Pacificæ,* Tayl.; caule laxe cæspitoso, tenui adscendente, pinnato; rameis brevibus, gracillimis, laxis, patentibus; foliis caulinis laxis, ramis imbricatis, omnibus patentibus, oblongo-ovatis, apiculatis, integerrimis, convexis, basi grandicellulosis; auriculis brevibus, cylindricis, subincurvis; stipulis cordatis, bifidis; calyce ramulum terminante, majori, oblongo, elongato, obtuso, sursum trigono, tubifero.

HAB. Pacific Isles. *Nightingale.* n. 384. *Hook. Herb.*

Brownish-olive. Stems 2-3 inches long; distantly pinnate. *Perichætia* of several pairs of erect, close, secund, acuminate, subdentate leaves. Allied to our F. *exilis;* the leaves, however, are more acuminate, especially the perichætial, and the stipules more cordate.

15. F. *Cuencensis,* Tayl.; caule laxe cæspitoso, procumbente, vage subpinnato, subflexuoso; foliis imbricatis, erecto-patentibus, convexis, ex cordata amplexante basi ovato-rotundatis, integerrimis, margine exteriori recurvo; auriculis oblongis, brevibus; stipulis rotundato-ovatis, bifidis, margine recurvis; perigoniis rotundatis, sessilibus.

HAB. Cuenca. *Prof. W. Jameson, Hook. Herb.*

Patches loose, blackish-purple. Stems 2-3 inches long. Cellules of the leaves minute and condensed at the periphery, large in the centre. The auricles do not descend below the margins of the leaves. Stipules embracing the stems. Each of the perigonial leaves contain one or two round, pedicellated, greenish anthers. This may be known from F. *trinervis*, L. et L., by the leaves not being semivertical, by their thinner texture, by their minuter cells, by the smaller auricles, and by the larger and wider stipules.

16. F. *aculeata*, Tayl.; caule gracili, debili, implexo, procumbente, vage subbipinnato; foliis laxis, patentibus, cauli circumvolutis, cordato-triangularibus, setaceo-acuminatis, integerrimis, margine subreflexis; auriculis minutis, cylindricis, cauli adpressis; stipulis oblongis, bifidis, sagittato-amplexantibus; perigoniis lateralibus, sessilibus, oblongo-rotundatis.

Hab. Near Cuenca. *Prof. William Jameson, Hook. Herb.* Gallapagos Islands. *Darwin.*

Patches reddish-brown. Stems 3-4 inches long. Leaves in a dry state circumvolute around the stem. It is allied to *Jung. atrata*, Swartz; but the leaves are more distant and their tops elongated and acuminated into a setaceous point.

17. F. *spinifera*, Tayl.; caule implexo, procumbente, vage ramoso; foliis imbricatis, reflexo-patentibus, ellipticis, obtusis, integerrimis; auriculis minutis, inferioribus galeatis, extus acuminatis, cæteris ac plurimis evolutis, subulatis, rectis, antrorsum unispinosis; stipulis planiusculis, circularibus, acutissime bifidis; perichætiis ramulos proprios terminantibus, eorum foliis acutis, stipulari profunde bifido, segmentis laciniato-dentatis.

Hab. Auckland, New Zealand. *Dr. Sinclair, Hook. Herb.*

Patches wide, rather dense, olive-green. Stems scarcely ½ an inch long. In a few of the inferior leaves the auricle is sometimes helmet-shaped, usually however, it is short, setaceous, articulated, opaque; in the upper leaves and always in the perichætial it is expanded, subulate, and has the mar-

gins recurved. These singular forms of the auricles and the circular stipules render this species remarkable among the *Frullaniæ*.

20. Fossombronia, *Nees*.

1. F. *intestinalis*, Tayl.; fronde simplici, prostrato, lineari, flexuoso; lobis imbricatis, verticalibus, alternis, latis; marginibus tumenti-incurvis, integerrimis; calyce minori, campanulato.

Hab. Swan River. *Mr. James Drummond.*

Fronds 3-4 lines long. Roots purple. Lobes, when moistened, are very tumid, and have their incurved margins concealed. Capsule spherical, bursting irregularly. Seeds muricate, very black. *Elateres* longer than in F. *pusillæ*, Nees; besides, the calyx is far smaller, and the convoluted lobes give to our plant a peculiar habit.

21. Symphyogyna, *Nees et Mont.*

1. S. *Harveyana*, Tayl.; fronde stipitata, erecta, dichotoma; lobis lineari-oblongis, crassinerviis, margine dentatis.

Hab. Cape of Good Hope. *W. H. Harvey. Hook. Herb.*

Fronds pale pea-green, on an alate footstalk, dichotomous once, more seldom twice. Lobes narrow, oblong, slightly notched, the teeth of the margin wide at their bases. No fruit was present, yet calycine scales were observed within the involute terminal lobes, and were lanceolate bi-trifid. This species strongle resembles our S. *obovata*, detected by Dr. J. D. Hooker in Van Diemen's Land, but appears distinct by the more considerable nerves of the leaves, but which are destitute of the green parenchymatous matter in which the true nerve of the Van Diemen's Land plant is imbedded; also by the narrower lobes and by the stronger dentation of the margins.

2. S. *leptothelia*, Tayl.; fronde implexa, procumbente, substipitata, subdichotoma, late lineari, tenuissima, tenuiner-

via, margine dentato-spinosa; perigoniis alternatim seriatis, supra nervum confertis; calyptris epiphyllis, elongatc obovatis, apice pistilliferis, basi squama laciniato-dentata tectis.

HAB. On Casapi. *Mathews. Hook. Herb.*

About an inch long, very pale olive-green. Fronds creeping, the young and barren often acute. Young fronds issue as stipitate buds from the extremity of the nerves of the aged. Capsule linear, splitting into four or more valves, united at their tops. Seeds about four times the diameter of the *elateres*. *Perigonia* are scales similar to those at the base of the calyptra, but more concave, each containing a single anther. Differs from S. *Harveyana,* Tayl. by the creeping fronds, which are less divided, and by the spinous teeth of their margins.

3. S. *atronervia,* Tayl.; fronde subsimplici, elongata, angustissime lineari, subadscendente, margine integerrima, flexuosa, nervo tenui, utrinque parenchymate atro-olivaceo comitante; calyptris basi angustatis, ellipticis, apice pistilliferis, basi squama oblonga laciniato-dentata tectis; capsula cylindracea.

HAB. Pillzhum, Colombia. *Prof. William Jameson. Hook. Herb.*

In loose patches, the young of a light green, the more aged dark olive-green, with the *parenchyma* at each side of the nerve nearly black. Fronds nearly 2 inches long, usually simple, the lower half sending down rootlets, the upper free and ascending. The calyptra closely invests the base of the pedicel of the capsule, and hence appears stipitate. Valves of the capsule irregular in breadth and in number, adnate at their summits. This has the habit of *Diplolæna Hibernica,* Tayl., but is destitute of a true calyx. The frond is narrower than in any described *Symphyogyna.* The capsule consists of two membranes, of which the exterior is cuticular and very thin, the interior composed of several parallel, longitudinal series of cells. At maturity the inner membrane splits along

these series indifferently into several valves or pieces of unequal breadth; all, however, united at their summits.

4. S. *pulchra*, Tayl.; fronde implexa, procumbente, substipitata, subsimplici, lineari-elliptica, apice biloba, integerrima, margine flexuosa; perigoniis alternatim supra nervum confertis; calyptris epiphyllis, linearibus, apice pistilliferis, basi squama tubulosa subdentata tectis.

HAB. Swan River. *Mr. James Drummond.*

Fronds pale green, scarcely 1 inch long, largely and distinctly cellulose. The tops of the nerves send down rootlets, and send forth buds, which at first appear to consist solely of a nerve, but which as it elongates assumes a *pagina* at each side. Peduncles 4-5 lines long. Anthers sphærical, whitish, pedicellated. The tubular, subterminal calycine scales distinguish this from the preceding, as well as from the other *Symphyogynæ*.

22. METZGERIA, *Nees.*

1. M. *algoides*, Tayl.; fronde erecta, compressa, gracili, bitripinnata, pinnis deflexis, pinnulis anguste linearibus, acuminatis, integerrimis, uninerviis; calyptris fasciculatis, axillaribus, oblongo-obovatis, apiculatis, scabridis, basi squamis aggregatis linearibus tectis.

HAB. Woods on the western side of Pichincha; n. 170. *Prof. W. Jameson. Hook. Herb.*

Fronds aggregate, 5-6 inches high, very slender, olive-coloured; branches alternate; margins of the pinnules entire. Two, three, or more *calyptræ* are collected about the upper parts of the fronds. *Calyptræ* thick and tough. Barren *indusia* are scattered over different parts of the frond. The branches are far more elongated and more deflexed than either in *Jung. fucoides*, Hook. or in *Jung. ericoides*, Hook. and the *calyptræ* are more clustered than in the latter.

23. FEGATELLA, *Tayl.*

1. F. *microcephala*, Tayl.; fronde minuta, canaliculata, dichotoma, sinu ampliori; pedunculis elongatis; receptaculis

fœmineis minutis, subglobosis, basi squamis indusii linearibus, albidis affixis.

Hab. H. I. 410. North America. *J. Drummond. Hook. Herb.*

Fronds lineari-obovate, about 3 lines long, soon turning brown; the margins slightly raised, incurved, having blackish-purple shining scales beneath. Pores of the frond raised, hemispherical, whitish, large. Peduncles rising from a wide terminating *sinus* and from beneath the fronds, blackish-brown, rigid, grooved, having a part of the *indusium* in whitish, linear, flat scales at their base and the rest at their summits. Female receptacle nearly round, of the size of turnep seed, rugose with pale pores on the summit, having 2-3 *loculi* underneath. The minuteness of all the parts, except the disproportionately long peduncles and the wider scales of the *indusium* distinguish this from F. *hemispherica*, Tayl.

24. Fimbriaria, *Nees.*

1. F. *mollis*, Tayl.; fronde implexa, prostrata, oblongo-obovata, apice biloba, supra subtusque læte viridi; receptaculis fœmineis subhemisphericis, virescentibus, apice brunneis, mollibus; loculo subtruncato; calycibus multifidis, albissimis; pedunculo epiloso.

Hab. Sicily Island, near New York. *Hook. Herb.* Also near Philadelphia, *Mr. G. I. Lyon's Herb.*

Fronds scarcely exceeding 2 lines in length, naked beneath except a very few purple lunulate scales, each with a single lanceolate tooth on one side. Peduncles twisted, brown beneath, but above participating in the yellowish-green colour common to nearly every part of the plant. *Laciniæ* of the calyx concave, rather obtuse, their edges incurved. Female receptacles very succulent. Peduncles very short. The hemispherical female receptacles destitute of any *apiculus*, soft and compressible, and the pale-yellow *lacinæ* of the calyx are very characteristic.

2. F. *Drummondii*, Tayl.; receptaculo fœmineo conico, obtuso, 4-lobato, areolis tumentibus scaberrimo; pedunculo supra indusii squamis linearibus, albidis apice purpureis pilosissimo.

Hab. Swan River. *Mr. James Drummond.* Van Diemen's Land. *Gunn, Hook. Herb.*

Fronds 5 lines long. Lobes crenate, with a few dark purple subulate obtuse scales beneath. *Loculi* usually 4, rarely 5. Calyces whitish, tipped with pale purple. Seeds scabrous, rotundato-triquetrous. *Elateres* twice as long as the seeds. Peduncle with a wide groove in front. Approaches our F. *Nepalensis*, but differs by the longer peduncle, which is naked at the base, by the more conical female receptacles divided into four lobes, by the more elongated calyx, by the deeper division of the fronds, and by the crenate lobes. The male receptacles are verruciform, pale, and terminal in the *sinus* of the frond, sessile and very rough from the prominent *loculi* of the oblong, erect anthers.

25. Anthoceros, *Linn.*

1. A. *tuberosus*, Tayl.; fronde orbiculari, concava; loborum marginibus elevatis, undulato-flexuosis, integerrimis; sterilium linearibus tubera radicantia ferentibus; capsula alato-striata; calyce obovato.

Hab. Swan River. *Mr. James Drummond.*

Male fronds narrower. In sterile plants especially, but not exclusively, at the extremities, lobes issue which are terminated by opaque, solid, subcompressed oval tubers; these, beneath a dark cuticle, contain a farinaceous mass. Similar tubers are found in certain other *Hepaticæ* of the same country, as in *Pelatophyllum Preissii*, L. et L., and in several *Ricciæ*. These tubers have their own rootlets, and would appear to be the place of refuge of the vital force during the torrid season of the year, when every other part of the plant is scorched up. They are, therefore, of the nature of buds. Anthers 1-5, clustered and immersed in the central parts of

the frond, each containing a whitish semi-fluid pollen. The capsule rises through the ruptured cuticle of the frond. The *calyptra*, as in A. *punctatus*, L., remains broken within the frond at the base of the peduncle. *Columella* filiform. Seeds subrotund, punctate, accompanied by shreds of placental membrane, which are not to be confounded with true *elateres*, of which this genus is destitute.

26. Podanthe, *Tayl.*

Char. gen. Dioica. Frons basi prostrata, porosa, apice squamosa, squamis imbricatis, recurvis. Receptaculum fœmineum descendens, lineare vel elongate conicum radices demittens. Calyx nullus? Indusium squamosum, terminale. Frondis masculinæ squamæ basi ventricosæ; antheræ majusculæ, concolores, rotundato-oblongæ, pedicellatæ.

1. P. *squamata*, Tayl. *Riccia squamata*, Tayl. in Drummond's Swan River Crypt.

Hab. Swan River. *Mr. James Drummond.*

Plants aggregate, 2-3 lines long, tawny-olive when dry, greenish and hyaline when moistened. The lower half is a frond, from a narrow base, linear or oblanceolate, slightly channelled, the surface with a few whitish scattered elevations of the cuticle or pores; the upper half which first rises and then reclines is singularly scaly, the scales roundish, their margins recurved, their structure punctate; between the terminal and largest pair are found 2-6 minuter and narrower scales, clustered and a little incurved, which are supposed to constitute the *indusium*, but no pistils have been observed: from the extremity of the scaly part is a prolongation of the mid-rib, radicating, in structure and position analogous to the descending receptacle of *Gymnanthe*, Tayl. The anthers are sometimes obviously clustered over the midrib, and again may be found lying each within the ventricose base of the perigonial scales.

27. Riccia, *Linn.*

1. R. *plana*, Tayl.; fronde orbiculari, cavernosa, stellatim 4-5 lobata; lobis planis, quadrato-rotundatis, crenatis, subtus nudis.

Hab. Swan River. *Mr. James Drummond.*

Fronds scarcely ½ an inch in diameter, and the lobes about 3 lines, greenish-white, slightly crenate or irregularly angulate; when moistened the cavernous appearance vanishes; margins of the lobes scarcely elevated. This has some resemblance to R. *crystallina*, L.:—however, the fronds are more thin and delicate, wider, more angulate, by no means channelled and more compressed to the soil.

2. R. *acuminata*, Tayl.; fronde orbiculari, radiatim divisa; lobis linearibus, dichotomis, acuminatis canaliculatis, margine elevato, inflexo, subtus nudis.

Hab. Swan River. *Mr. James Drummond.*

Fronds 1 inch in diameter. When moistened, the lobes swell and their margins are so closely inflexed as to remind one of the *lirellæ* of an *Opegrapha.* The under surface is quite destitute of scales. The pale green frond looks as if sprinkled with a white powder. The acuminate lobes distinguish this species from R. *crystallina*, L.

3. R. *cancellata*, Tayl.; fronde suborbiculari, cavernosa, radiatim divisa, lobis incrassatis, excavatis, dichotomis lineari-oblongis, obtusis, margine subtus nudis.

Hab. Swan River. *Mr. James Drummond.*

Lobes nearly 2 inches long, of a sordid, pale green colour, very tumid, the cavernose depressions varying in size but crowded. This is one of the largest species of the genus. In a dry state there is a brown tinge of the base of the lobes.

4. R. *vesicata*, Tayl.; fronde cuneata, dichotoma, lobis approximatis, linearibus, obtusis, tumidis, subcanaliculatis, corrugatis, vesiculatis, margine subtus nudis, tubiferis.

Hab. Swan River. *Mr. James Drummond.*

Fronds aggregate, scarcely ½ an inch long, sprinkled over with pale green minute vesicles of different sizes, whose apertures are unequal. The more adult fronds have sometimes purple cells towards their centres. Capsules solitary, at the bifurcation of the lobes crowned with a black style. Seeds oblongo-rotundate, angulate. Under the margins of the fronds occur solid oblongo-rotundate bodies rolled up in rootlets; such, probably, are the buds.

5. R.? *tuberosa*, Tayl.; fronde erecta, fusca, tenui, ex angusta basi obovata, margine rotundato, undulato, bilobo, basi radices inter tuberifera.

Hab. Swan River. *Mr. James Drummond.*

Plants aggregate, 2-3 lines high, subpellucid when moistened, in colour resembling a *Nostoc,* in structure a *Jungermannia.* Two fronds are sometimes so opposed as to include a cup-shaped cavity. At the base of the fronds, involved in rootlets at the terminations of short processes are found solid, pale tawney, rotundate or oblong bodies, solitary or two together, a little curved, resembling the tubers of the *Orchideæ.* Such, when pressed under water, yield a fine *farina* as well as opaque globules. Such tubers are so similar to those of the preceding species, that the present is temporarily placed among the *Ricciæ,* although it has more the habit of a *Symphyogyna.* The discovery of the fructification alone can clear up the genus.

6. R. *crinita,* Tayl.; fronde glaucescente, late lineari dichotoma, canaliculata, margine incurvo, squamis marginalibus minutis atro-fuscis atque ciliis albidis, subulatis, rigidis, conniventibus, subbinis occlusa.

Hab. On clay; n. 42. Swan River. *Mr. James Drummond. Hook. Herb.*

Fronds rather dispersed, three-tenths of an inch long, closed near the *apices* by white *ciliæ* from beneath the opposite margins; the length of these *ciliæ* and the purple margins of the fronds separate this from R. *ciliata,* Raddi.

7. R. *lata*, Tayl.; fronde cuneata, dichotoma, æquabili, læte virenti, lobis oblongis, obtusiusculis, canaliculatis, lævibus, tumescentibus, margine subtus squamosis, squamis rotundatis, concoloribus, distantibus.

HAB. Swan River, *Mr. James Drummond.*

Fronds half an inch long. In young plants the marginal scales being concolorous with the fronds, are not easily observed. Beneath a pit on the channel of the frond are buried together one or two capsules with cuticular sides and large brownish seeds. On other fronds, near the base of the lobes are placed in a series along the channel 6-10 emerging, linear bodies; these are erect, the emerging part is of the same colour as the frond, but the part immersed is dark purple. Such are quite distinct from styles, and may be the male parts of fructification.

8. R. *porosa*, Tayl.; fronde cuneata, dichotoma, porosa, sordide stamineo-virescenti, lobis tumidis, linearibus, margine subtus squamosis, squamis minutis, purpurascentibus.

HAB. Swan River, *Mr. James Drummond.*

Nearly an inch long, lobes substellate; the pores placed in a series along the channel of the frond: lobes when dry acute. Capsules two or three together, rather large, at length opening by a rupture of the cuticle of the frond.

9. R. *punctata*, Tayl.; fronde orbiculari, æquabili, dichotoma, lobis linearibus, concavis, siccitate punctato-cellulosis, margine subtus squamosis, squamis majoribus, rotundatis, imbricatis, atro-purpureis, subtus elevato-punctatis; capsulis subconfluentibus.

HAB. Swan River; *Mr. James Drummond.*

Half an inch long; lobes radiating, their surface glaucous-green, minutely reticulated, the margins with a blackish limit of dark purple imbricated scales, whose inferior surface, especially in a dry state, is closely set with elevated shining points. Capsules 6-8, contiguous. Seeds large, angulato-rotundate, smooth, dark brown.

10. R. *inflexa*, Tayl.; fronde cuneata, dichotoma; lobis canaliculatis, acutis, pallide virescentibus, siccitate occlusis, subtus squamosis, squamis majoribus, atro-purpureis, siccitate plumbagineis, basi subconfluentibus, apice rotundatis, frondis marginem excedentibus, recurvis, celluloso-punctatis.

Hab. Swan River, *Mr. James Drummond.*

Fronds carnose, 3-4 lines long. On the surface the hexagonal cells of the frond are eminent. Capsules single, or at most two together, bearing black spicules or styles, which are shining. Seeds large triangulari-lentiform; by transmitted light the margins are opaque, but the disk pellucid.

BOTANICAL INFORMATION.

Notes on the Botany of the Pyrenees, in a letter to the Editor, from Richard Spruce, Esq.

(*Continued from p.* 350.)

In my walk to Cauteret, the next day (July 10th), I was accompanied by Dr. S. The distance by the regular route is ten miles, but by the advice of a person who knew something of the botany of the district, we climbed the mountain on the right, ascending by the picturesque church and château of St. Savin, the latter the residence of the family of Despourrins, the "Burns of the Pyrenees." But our toil was to little purpose, for we gathered nothing more interesting than *Astrantia major*. On descending into the Gorge de Cauteret, I found on a wet rock *Jungermannia compressa* and *Dicranum fugax*, and a few flowering plants. We set out the following morning, in the midst of a dense fog, to ascend to the Pont d'Espagne, and although we could seldom see more than a few feet before us, we returned in the evening with such a

load of rarities as amply repaid us for the wetting we sustained.

My sojourn at Cauteret extended to above three weeks, and during this time I explored nearly every mountain and valley which lay within a day's journey. For beauty of scenery and variety of vegetation the environs of Cauteret are equalled only by Bagnères de Luchon. Situated in a species of "cirque," into which converge the three valleys of Lutour, Combascon, and Mahourat, each traversed by its tumultuous Gave, at a height of nearly 3,000 feet above the sea-level, and surrounded on every side by precipitous forest-clad mountains, which do not admit the summer sun of these southern climes to shine upon it before nine in the morning, and shut out its beams by three or four in the evening, while in the distance, on the east and west, rise still loftier and snowy peaks, Cauteret stands, the very beau ideal of savage mountain scenery, and affords every variety of locality which a botanist can desire. The rocks around are chiefly granitic, with here and there masses of micaceous schist, and on the summits the limestone, which caps nearly all the mountains in the Pyrenees. The principal stream, called the Gave de Marcadaou, takes its rise on the Pic, of the same name (on the Spanish frontier), crosses the Plateaux de Marcadaou, and descends the steep and wild Gorge de Mahourat (sometimes called the Val de Jéret), to receive its two tributaries a little above Cauteret. At the top of this gorge, about six miles from Cauteret, it is crossed by the Pont d'Espagne, before mentioned; and about two miles on the left of the bridge lies the lonely Lac de Gaube, above which tower the glaciers and snows of the Vignemale, the highest mountain in the French Pyrenees. It was the labour of three or four days, after parting with my friend, Dr. S., to fully explore the Gave de Marcadaou, with its cascades, its rocks, and its forests. I have as yet examined but few of the *Cryptogamia* from this locality. One of the most interesting is the *Leskea pilifera* of Swartz, a plant which has

been strangely overlooked by Bridel and others, though a beautiful and well-marked species. Excellent original specimens exist in the herbarium of Sir J. E. Smith, with the following note in Swartz's handwriting: "H. *denticulato* similis sed vera *Leskea*; proxima L. *pulchellæ* sed diversa;" and I have myself authentic specimens given me lately by MM. Bruch and Montagne. Another species of the same genus is the L. *Vaucheri* of Schimper, which has been mistaken for L. *attenuata*, though a very different moss; I have seen it in several other stations in the Pyrenees. *Leskea subtilis* and *pulchella*, *Hypnum dimorphum*, and *callichrous*, Brid., were in excellent fructification, but H. *umbratum* had lost its opercula. It was near the Pont d'Espagne that I found on decayed wood the only splachnaceous plant I have remarked in the Pyrenees; it is probably a species of *Tayloria*. In the same place grew the handsome *Mnium spinosum*, and a *Dicranum* looking very much like *longifolium*, but wanting the broadly-nerved leaf of that species; I believe it the D. *Sauteri* of Bruch. *Orthotrichum rupestre* and *Hutchinsiæ* were in the greatest abundance, as were also several species of *Grimmia*, among which I recognized G. *spiralis*, *patens* and *ovata* in good fruit; G. *elatior*, *leucophæa* and *commutata* were rather advanced; and I have some others which are quite unknown to me. In this valley, and especially near the Lac de Gaube, I added largely to my collection of flowering plants. The following are the most interesting, and I can now speak on them with certainty:

Ranunculus aconitifolius.
          Gouani.
Viola biflora.
Homogyne alpina.
    (Tussilago, *L.*)
Pyrola uniflora.
Potentilla rupestris.
Spiræa Aruncus.

Sempervivum arachnoideum.
montanum.
tectorum.
Funckii.
Saxifraga aquatica.
Chærophyllum hirsutum.
Adenostyles albifrons.
Veronica saxatilis.
Tozzia alpina.
Ajuga pyramidalis.
Statice alpina.
Luzula pediformis.
Carex decipiens, *Gay*.
(C. macrostylon, *Lap. ?*)
ornithopoda, *Willd.*
Festuca spadicea.

On the 21st, having been rejoined by Dr. S., we ascended Mont Lizé together, and made a most excellent herborization. This mountain is scarcely known to the visitors at Cauteret, where indeed it is not visible, being entirely hidden by the less lofty Pic des Bains. It is true that tourists are in the habit of traversing the Col de Lizé between Cauteret and Luz, but it is the mountain on the right of the pass which we found so rich, especially in flowering plants. Leaving the regular track, we mounted by a precipitous stream, which descends from the Pic des Bains, and gathered on its banks *Marchantia androgyna, Catoscopium nigritum, Meesia uliginosa, Hypnum polymorphum*, and *Halleri*, with some other mosses and several *Phanerogamiæ*. Our best plants, however, were gathered on a ridge of schistose rock, near the top of the mountain; we should probably have passed it without examination, had not my companion's pocket-telescope shown that it was partially covered with a small and peculiar looking shrub, which we found, on a nearer inspection, to be the beautiful and scarce *Ononis rotundifolia*.

On the same rock were also *Gypsophila repens, Phaca australis, Antirrhinum sempervirens, Pedicularis comosa, Androsace carnea*, &c.; and at its base, near to a ravine filled with snow, *Ranunculus alpestris* and *montanus, Pinguicula alpina* β. *bimaculata*, Wahl. (P. *flavescens*, Flörke), and some others. The most interesting plants gathered on Mont Lizé, besides those just enumerated, are :

Anemone vernalis.
Ranunculus Pyrenæus.
Draba aizoides.
Arenaria ciliata.
grandiflora, *All.*
Geranium cinereum, *Cav.*
Dryas octopetala.
Potentilla minima.
Epilobium alpinum.
Carduus carlinoides.
Myosotis sylvatica.
var. alpestris.
Veronica aphylla.
Androsace villosa.
Salix Pyrenaica.
reticulata.

My collection was also considerably enriched by my herborizations in the Valleys of Lutour and Combascon, and in the immediate neighbourhood of Cauteret. Among the mosses I may mention *Hypnum plicatum*, Schleich., *Leskea incurvata* and *Leptohymenium filiforme* in fruit, *Bartramia calcarea, Tortula aciphylla* and *Trichostomum glaucescens.* The principal flowering plants were :

Thalictrum aquilegifolium.
Cardamine resedifolia.
Viola cornuta
Astrocarpus sesamoides.

*Dianthus ——?
Medicago minima.
Vicia sativa, *var*. Pyrenaica.
Rosa alpina, *v*. Pyrenaica.
(R. Pyrenaica, *Gouan*).
Herniaria Pyrenaica, *Gay*.
Orlaya grandiflora.
Sambucus racemosa.
Galium vernum.
Valerianella dentata, β. *Koch*.
Auricula β.
Soyeria lapsanoides.
(Hieracium, *Gouan*).
Veronica Ponæ.
Pedicularis foliosa.
†Rumex ——?
Paronychia serpyllifolia.
Crassula rubens.
Saxifraga Aizoon.
— β. minor.
Cotyledon.
Astrantia major.
Thesium alpinum.
Euphorbia verrucosa.

* No. 49 of my collection. This differs from D. *prolifer*, gathered at St. Sever, in the membranous bases of the leaves being connate for a distance equalling about twice their breadth, and in the strongly tuberculate seeds. The closely allied D. *velutinus*, Guss. (secund. exempl. in Herb. Hook.) has the seeds *muriculate* (beset with *sharp-pointed* excrescences), the leaves smooth at the edges, and the stems more or less downy. The seeds of D. *prolifer* are always somewhat tuberculate, and are therefore incorrectly described by Koch as *smooth*.

† No. 320 coll. Possibly a gigantic variety of R. *arifolius*, All.; but the leaves are cordate-sagittate (not hastate), and the upper ones are never acuminate. It is perhaps what Lapeyrouse has called R. *amplexicaulis*, cited by Mr. Bentham as a synonym of R. *arifolius*.

Nigritella angustifolia.
Allium fallax, *Don.*
Botrychium Lunaria.

Being very desirous to penetrate into the Pyrénées Espagnoles, I made frequent inquiries respecting the state of the passes; but the accounts I received were by no means encouraging. There was said to be yet a great deal of snow remaining, and no tourist had attempted to cross the Port de Cauteret, which conducts to the Spanish baths of Penticosa. I knew, however, that smugglers were in the habit of traversing it daily, as I frequently encountered parties of them near the Pont d'Espagne, and resolving to make the attempt, I wrote to Dr. S. at Argélez, requesting him to join me, which he did on the evening of the 1st of August. We commissioned our guide, Carro, who had also accompanied us to Mont Lizé, to procure us horses, which we proposed taking as far as the foot of the Pic de Marcadaou; but unfortunately, several "cavalcades" were arranged to come off the following day by the "monde" at Cauteret, and every horse was engaged. There was, then, no alternative but to walk, and we started in the morning at about eight o'clock, accompanied by our guide and a young fellow whom we engaged to carry our baggage to the frontier. Our path lay along the banks of the Gave de Marcadaou and over the Pont d'Espagne, and in crossing the plateaux which succeed, we sat down by a spring to eat a slight lunch, when we were joined by four contrabandista, who were thence our companions for most of the journey. Four wilder or more picturesque-looking fellows I have seldom seen, embrowned and almost blackened with constant exposure to the weather, and clad in the Arragonese costume, namely, a blue or brown jacket copiously braided in front, breeches of black or green cotton-velvet, with bunches of white ribbon at the knees, ribbed stockings, and *spardines,* to which must be added a girdle formed of several folds of blue or crimson calico, passed

round the loins, and a handkerchief tied round the lower part of the head, allowing the hair of the crown to stand bristling out at the top. The articles of their illicit traffic were certainly not less strange than their costume; fancy three of these men carrying enormous back-loads of empty glass bottles, over frozen snows and down the rocky face of all but perfect precipices, where even with the aid of my pole, and with nothing to embarrass me, it was often a matter of difficulty to preserve my balance. Our fourth companion, a veritable Sancho Panza for size and build, carried a smaller but perhaps much heavier load of various fancy articles of ladies' wear, besides umbrellas, &c.

A walk of seven hours, herborizing by the way, brought us to the extremity of the Vallée de Marcadaou, and to the foot of the last mountain in France. We were now in a *cirque*, such as terminates all the valleys of the Pyrenees, and on entering it, I cast around a wistful eye for some opening through the mass of frowning mountains which seemed to be closing round us; but nothing met my eye save tiers of snow alternating with masses of black rock, and foaming cascades issuing from one tier of snow to lose themselves under a succeeding one. I demanded of our guide, with some anxiety, which was the "Port de Cauteret?" "Le voilà!" said he, pointing out a scarcely perceptible dimple between two peaks on the very summit! Assuredly, I had little hope of ever attaining it, especially when he added, that we had yet two hours of toilsome ascent. However, there was no time for delay, and we commenced our upward course. Sometimes there was the semblance of a path, and sometimes there was none, and great part of the ascent was a genuine escalade, the projecting edges of nearly perpendicular strata forming a sort of steps. We were obliged to pause about every ten minutes to take breath, and it cost us an hour to reach the margin of the first field of snow, where we sat down on some rude blocks of granite, the débris of the cliffs above, and took a little refreshment. We gave the Spaniards of our *eau de*

vie, and they gave us of their wine, which they carried in the usual bottle of the Pyrenees, namely a pig's skin, sewed up, with one leg left on for the neck. Although the ascent was considerable, the snow was sufficiently soft on the surface to enable us to traverse it without difficulty, and also to fill my shoes and make my feet very wet and uncomfortable. We passed, in like manner, two or three other fields of snow with intervening ridges of granitic rock.

We were all considerably exhausted ere reaching the terminal ridge, as may easily be supposed, and the moment our companions set foot over the frontier, they threw themselves on the ground, notwithstanding the extreme cold, and the Spaniards were soon fast asleep. My first impulse was to follow their example, but just then a tuft of the beautiful *Saxifraga Grœnlandica*, growing in the chink of a rock, struck my eye. I sprung forward to gather it, when several other plants presented themselves, and thus instead of reposing, I was occupied in rambling about the rocks during my stay on the summit. We had come, in fact, upon a veritable garden, the beauties of which appeared the more striking, from the barrenness which had surrounded us during the whole of our ascent; and we gathered here *Saxifraga bryoides*, S. *androsacea*, S. *exarata*, Vill., S. *muscoides*, *Pedicularis rostrata*, *Potentilla Salisburgensis*, *nivalis* and *frigida*, *Gentiana alpina*, *Sesleria disticha*, *Encalypta rhaptocarpa*, besides several other plants equally interesting. During the last hour's ascent, we had been enveloped in brouillard, but a strong and intensely cold south wind was blowing through the Port, which chased all the clouds to the French side, and opened out to view a scene so magnificent, that I could not help pausing now and then in my interesting occupation to gaze upon it. We were at a height of something more than 9,500 feet above the level of the sea, and the two peaks on our right and left, though very little higher than the ground whereon we stood, prevented us from seeing anything in those directions; but before us were mountains—bleak, snow-

clad, vegetationless mountains—tumbled about in such savage confusion, that Milton's chaos could not have been more chaotic. In the extreme distance we could just discern the serrated ridge of the picturesque mountains of Huesca, at the foot of which lies Saragossa; while deep down at our feet, was a small lake, appearing like a blue gash in the snow; farther on was another, and then another a little larger, all encircled with snow. It was by these lakes we were to pass. We had now two hours of rapid descent to the baths of Penticosa, and in the ardour of our absorbing pursuit, we had allowed our Spanish friends to get before us; most unfortunately, as it turned out, for our guide was but ill acquainted with the way. Almost at starting, he led us down a steep tract of snow, as nearly perpendicular, indeed, as it was possible for snow to lie, and to our great surprise, more frozen on the surface than we had found any on the French side. The way we proceeded was this: our guide went "en avant," and at every step stuck his heels as deep as he could into the snow; we followed slowly and cautiously in his footsteps. Once, however, his footing failed him; and he slid down with fearful rapidity for forty or fifty yards, when he was fortunately arrested by a projecting fragment of rock, and escaped with a few hard knocks; had it not been for this, he must have slid on until he plunged into the fathomless lake below. He then fixed his pole firmly into the snow, and entrenched himself with our carpet bags, and we slid down after him, he stopping us when we reached him. A great deal of our downward course was of this description, but when we reached the margin of the third lake, where was a grassy knoll peeping out of the snow, we spied our Spaniards sitting, eating, and smoking their paper cigaros. We were glad to rejoin them, and took care not to part company during the remainder of our journey. We had little more snow to pass, but the rocks and precipices we descended would baffle all description, and on looking back occasionally upon our track, it seemed almost impossible that human foot

should traverse it. In foggy weather, and to a person not acquainted with every step of the way, the danger must be extreme, and I was told that a certain number of broken necks occur here every year.

It was seven o'clock in the evening when we reached the baths of Penticosa, and as we did not arrive in company of the most respectable description, the *aduaneros* paid us the compliment of carefully examining our baggage and the pockets of our guide. The smugglers had taken the precaution of hiding their wares in a ravine a mile above the baths, whence we understood they would be fetched when the night closed in; but our friend "Sancho" had prevailed with Carro to allow him to attach two umbrellas, along with mine, to my portfolio, and two reticules to Dr. Southby's carpet bag, of which he then took possession, and entered Penticosa in the capacity of our porter. The revenue officers saw plainly that two of the umbrellas were quite new, and therefore seized all three; but after a deliberation of some hours, they came to the conclusion, that as there were three of us, and only an umbrella for each one, they could not detain them with any show of right.

An inscription, in French, over the pump-room at Penticosa, states that the baths are 8,300 "pieds Catalans" above the level of the sea; the climate is, therefore, not very different from that of Greenland, yet here we found "poitrinaires" from nearly all parts of Spain, and the solitary hotel was quite full of visitors. I can imagine nothing more *triste* than a residence at Penticosa; the Spaniards, however, what with drinking the waters, smoking, playing at cards, and prolonging their siesta an hour or two beyond its ordinary duration, seemed to get through the time very comfortably. Our three days' stay was very profitably spent in exploring the gorge between the baths and village (a distance of two hours), and a rocky tract extending beyond the latter in the direction of the mountains, called Tindanière. The following list contains the most interesting plants collected at Penticosa, and

on our return across the Port de Cauteret, which we accomplished on the 6th, proceeding on foot as far as Cauteret, and thence in a calèche to Argélez the same evening.

Aconitum Lycoctomum.
Ranunculus Pyrenæus.
var. plantagineus.
*Draba nivalis.
Nasturtium Pyrenaicum.
Helianthemum vulgare.
γ. versicolor *Benth. Cat.*
†Dianthus ——?
Gypsophila repens.
Saponaria ocymoides.
Cerastium alpinum.
Medicago suffruticosa.
Vicia tenuifolia.
Potentilla alchemilloides.
Sedum altissimum, *Poir.*
Saxifraga granulata, *var.*
Bupleurum falcatum.

* No. 32 Coll. I believe this the true plant of Willdenow. The following character is from my notes, "Folia lanceolato-spathulata basi angustata, pube stellato-ramosa subtomentosa. Pedicelli glaberrimi. Calyx parce pilosus. Silicula lanceolata s. elliptico-lanceolata." It is, perhaps, the D. *Wahlenbergii,* Hartm. *β. heterotricha,* Lindbl. of Koch's Synopsis, Ed. 2, p. 69, and is apparently intermediate between this species and D. *Johannis,* Host.: agreeing with the former in the aphyllous or monophyllous scape, and with the latter in the stellato-pubescent leaves.

† No 51 Coll. This includes two plants, a smaller and single-flowered one, and a larger branched plant, which I joined on examination, but am now disposed to keep apart. The former I refer to D. *hirtus,* Vill.; the latter approaches closely to D. *brachyanthus,* Boiss , but has not the calyx ventricose at the base as in that species. I am informed by M. J. Gay, that he gathered the very same plant, in the same locality, twenty-three years ago, and that he has since kept it in his herbarium without any accurate determination. M. Planchon has compared the two with examples in the Hookerian herb., and considers them both forms of D. *hirtus.*

Ptychotis heterophylla.
Galium pumilum.
Artemisia spicata, *Wulf?*
Chrysanthemum alpinum.
Erigeron alpinus.
Cirsium Monspessulanum.
Campanula persicifolia.
Jasione perennis.
*Phyteuma hemisphæricum, *v.*
Echinospermum Lappula.
Ramondia Pyrenaica.
Antirrhinum majus.
Digitalis lutea.
Erinus alpinus.
var. hirsutus.
Veronica Austriaca.
Nepeta graveolens, *Vill.*
Prunella alba.
Sideritis scordioides.
var. hyssopifolia.
Teucrium Chamædrys.
Statice alpina.
Gagea fistulosa.
Luzula spicata.
Carex curvula.
Asplenium Halleri.

(*To be continued.*)

* No. 236 Coll. This seems to unite *Ph. humile* to *Ph. hemisphæricum*, having the bracts sharply toothed at the base, yet seldom above half the length of the capitulum. The leaves are all minutely and remotely toothed. Koch describes the bracts of the *Ph. humile* as "integerrimæ," Mutel figures them as strongly serrated.

Zeyher and Burke;

South African Collections of Plants.

(*Mr. Burke's Journal, continued from p.* 22.)

The weather is too hot for flesh to keep long, and thus we are often driven hard for want of animal food. Four days again elapsed ere our chace was successful, when we killed a rut-bok. The elands are wild, and keep far off. This part of the country is thickly covered with several species of *Acacia*. On the 29th we reached the junction of the Crocodile River with the Stork Stromme, where we saw several giraffes and a large white rhinoceros, which we killed, but could only carry away his head, the whole animal being too heavy a load for our waggon. Two of the giraffes were captured, one of which pined and died, and the other contrived to strangle itself. The horse on which these creatures had been chased, was so terrified, that he ran away, and we lost several days in seeking for him, and when recovered, the creature was so wild as to be almost useless. The lions had pursued him, and I only wonder that he was not devoured the first night. A party of natives gave information, and assisted in recovering the truant, and we rewarded them by shooting Guinea-fowls, of which there were large flocks in the vicinity. Certainly this land seems to be wholly relinquished to wild beasts. When we had chosen our night's quarters, four white Rhinoceros' came out of the bush, and we judged it best to decamp; but had no sooner seated ourselves elsewhere, than a lion rushed among the oxen, which all, most wisely, ran directly into the fires, and our people setting up loud shouts, the lion retired as quietly as he came, leaving the cattle unhurt. The Guinea-fowl ran thick here, like fowls in a poultry-yard at home. We shot two elands for food, and caught a fine young male, which proved almost equally troublesome with the giraffe, for he nearly killed himself with dashing against the waggon; so I fastened him

to an *Acacia* tree, growing from the bank of the river, where he might kick, struggle, and roll at will, without harming himself, all day; and at night I made a good fire and slept by his side.

On the 17th of September, as game was becoming scarce in consequence of our guns and fires, and lions and rhinoceros abounded, I judged it best to proceed no farther, but began retracing our steps. Several species of *Acacia* were coming into flower. A rhinoceros visited us at night and scared our cattle, but did no harm. Next day we captured two young giraffes, which I spared no pains to convey in good health to head-quarters; but again disappointment awaited me. One of them burst the strap that confined her, and could not be secured without such injury that she died. The other refused to walk, the heat seeming to exhaust these creatures, and we found great difficulty in transporting it by waggon, which we did for five days, when it had become quite tame; and then, to our great vexation, was seized with some complaint in the head and died. We were travelling down the dry channel of a small river, and Mr. Zeyher and I slept there nightly, stretched across the narrow bed, which is the securest place for the animals; but we narrowly escaped a very alarming visitor, a rhinoceros, who came quite close to us, poking for sport-holes in the bank of the river with his horn, and would infallibly have trodden on us, but that he fortunately turned back by the way he came just before reaching the spot where we lay. The following night a storm came on, just as we were securing the horses; one was alarmed by the lightning and ran away, and we could not recover him in the dark. It was impossible to sleep that night; the incessant roaring of the lions made me give up the horse for lost, but at day-break, to my great joy, I saw him standing quietly by the waggon. The elands were most troublesome captives; sometimes they would neither walk nor lead, and again they would run in the opposite direction to that which we wanted. More than once we were overtaken by heavy rain, and wetted to the skin; and as I had left most of my clothes in the

waggons, and the *Acacia* bushes had rent my linen to shreds, I had not a dry shirt to put on. The 25th of September saw us on the banks of a river, with the name of which I am not acquainted. Flocks of parroquets were in the bushes near the stream, and plenty of fish in the water. For two days we travelled along, the stream being very difficult to ford, when a high hill forbade our farther progress. We saw a pack of wild dogs running near, and a Hottentot shot one; the moment it fell, the others seized and devoured it. The vicinity of this river seemed unhealthy; Mr. Zeyher and I felt very unwell, and the cattle looked quite exhausted. We decided, therefore, on going to higher ground, where the air might be purer, and were hardly two miles away from the stream, when one of the oxen suddenly fell, and before we could release the team from the yokes, he was dead. On opening the animal, his liver looked blue, with a hard crust; but on an incision being made through the indurated surface, the quantity of blood that issued was immense, and the liver remained quite hollow. Rain, and a heavy dew, and close warm atmosphere prevailed for some days, and kept up the feelings of illness in ourselves and the animals; and after the oxen began to improve, the horses continued very weak.

Many interesting plants are now in flower. A pretty perennial *Cassia* is very ornamental, and I have taken up several specimens and planted them in empty powder canisters, though without much hope of their thriving, as the root is of a tap kind. Two pretty species of *Ipomæa* grow here, one a climber, the other runs along the ground. On the night of the 7th of October, two lions visited us. We were made aware of their vicinity first by the uneasiness of the cattle, and then a dog which lay by me, scenting them, set up a furious barking, to which a tremendous roar gave response. The guns were discharged and the beasts made off; it is remarkable, that the firing of a gun immediately tranquillizes the oxen and horses on such occasions. We have lately found two ostriches' nests, one with twenty, and another with ten eggs; which afforded an agreeable change

of diet, for we felt quite loathed with constant subsistence on flesh-meat.

After remaining in this neighbourhood rather more than a week, it was decided that Mr. Zeyher should return to Macalisberg with the few animals that we have captured, for they become daily weaker, because we have not milk enough to give them. The goats and cows left there must have had their young ones ere now, and Mr. Zeyher will send back the waggon in which he travels thither as quickly as possible for me. One young Hottentot volunteers to be my companion, and we shall keep the horses in case of being obliged to leave this place before the waggon returns. A thunderstorm came on, and the young male eland suffered so much from its effects, that he died next morning. I always give the young animals a draught of warm milk and water at midnight, and it should be milk alone, which would be better for them, if we had enough of it. Mr. Zeyher set off, taking the three remaining elands and a giraffe. For three days after the departure of the waggon, we were free from the visits of the natives; but on the 20th, nine of these wretched creatures arrived, tormenting us for food, which we had not to give, and obliging us to keep an incessant watch, or they would steal the horses, the blankets, and anything they can lay hold of.

On the 22nd we caught a young male sassaby. That evening the waggon returned, and Punyer came with it. He tells me that the giraffe died just as Mr. Zeyher got it to Macalisberg; that we have lost nearly all the goats and many of the sheep, those which remain being in a wretched condition. One ox has died and another was lost, and a pair of lions came at night and carried off one of the elands. To complete their misfortunes, the grass round our waggons at Macalisberg was fired by an emigrant farmer, and everything must have been destroyed, if Punyer and all the Hottentots had not happened to be on the spot, and also a good many natives, who assisted in saving our property. With much labour the waggons were extricated. A chest, containing 100 lbs. of

gunpowder, was fastened under the waggon which held our choicest collections; had the fire reached it, there must have been awful loss of life. The fellow, whose act in firing the grass had caused all the alarm and danger, stood coolly by, and would not assist, till the flames taking a rapid and unexpected direction, threatened his own waggon, when his pitiful cries moved the compassion of my people, who helped him to remove it from the danger.

I remained a few days longer in the neighbourhood, hoping to procure more animals, but with little success. The young sassaby did nothing but fret, and at last it died. One night, finding that the oxen were very uneasy, I went to quiet them and to replenish the fires with wood, when I saw a large lion, looking at me; but on turning to fetch my gun, which is always kept under my blanket, he made off. We saw numbers of gnoos, sassabys, and crowned cranes; and Punyer shot a small brown guso, of which I preserved the skin. As, however, grass is become very scarce, it is well to return to Macalisberg. On the morning of the 29th of October, we had the alarming spectacle of two white rhinoceros and ten lions. They all emerged from one bush, about 500 yards from our waggon, and stood gazing a good while, as if considering whether to advance or retreat; and while we were fastening the heads of the foremost to the wheels of the waggon, that they might not run away while we fired, the savage animals turned leisurely round, and disappeared in another part of the bush. I was so desirous to catch some young elands, that I halted four days in a spot where I noticed a species of *Dodonæa*, on the foliage of which they feed, to be very plentiful, and I was so happy as to catch three, and two young sassabys; but when I had got them, the largest eland was so wild, that I had to stand by him all night, lest he should kill himself with struggling, and the sassabys pine and will not eat. Moreover, the want of grass causes our cows to be nearly dry, and the horses fall off so much, that they cannot overtake the animals which we pursue. My people shot a fine fat giraffe, of which the flesh is a great treat to us; these

animals are now in good condition, from feeding on the leaves and young shoots of the different species of *Acacia*.

At last, quite worn out with fatigue, want of food, and the vexation of seeing almost all the animals I had caught perish for lack of proper nutriment, I returned to Macalisberg, having been absent nearly three months upon this excursion, and without Mr. Zeyher for the last four weeks.

(*To be continued*).

BOISSIER. *Spanish Botany. Excursions round* MALAGA, *&c.*

(*Continued from Vol. IV. p.* 393).

On the 14th of May, after despatching my whole collections to Malaga, I pursued my journey, and soon reached Coin, passing through a fine country, intersected with valleys, where *Thalictrum glaucum* adorned the edges of the water-conises, and the fields were enamelled with the blue flowers of *Convolvulus tricolor*. Coin, which is only two leagues distant from Alhaurin, is a rich and still larger village, abounding, too, with that rare blessing in Spain, spring water; I noticed with admiration several fountains, where the water was gushing from ten or fifteen sources. These two villages and their delicious neighbourhood supply Malaga with almost all the vegetables consumed in that city; and the combined moisture and coolness of the air allow the fruits of our temperate regions, such as *cherries* and *strawberries*, which cannot be raised on the coast, to grow side by side with the *orange* and *citron*. I noticed large beds of ripe strawberries, the species being the same as with us, and equally fragrant.

After quitting Coin, the ground continues to rise and to become less fertile, the clayey soil being little cultivated and surrendered to the indigenous and characteristic production of *Phlomis Herba Venti*, *Echinops strigosus*, several species of *Scolymus* and the *Cynara carduncululus*, the latter is that wild type of the artichoke, and attains an enormous size, with

thorny leaves, three feet long. The village of Mouda offers a striking contrast to Coin and Alhaurin; it is a hamlet, with narrow streets, built on a steep slope, and crowned with old ruins, which may be the relics of the ancient Munda, where a great battle was fought between Cæsar and the son of Pompey. The barber of the place was highly proud of this historical souvenir, and while relating the particulars, he shewed me a stream, which he declared had run down with blood on that memorable day.

Mouda is backed by Mount Peregla, a continuation of heights, composed of the same calcareous crystal as the Sierra de Mijas, but of considerably lower elevation. I crossed them the same day, intending to reach in the evening the sea-coast and the town of Marbella. Above the village, in a very hot exposure, I gathered *Reseda sesamoides*, var. *erecta*, *Sedum amplexicaule*, *Salvia patula*, and *Ononis speciosa*, together with the charming *Linaria Clementei*, which bears a short spike of violet blossoms on a simple and straight stalk, also *Silene villosa* and *Sideritis arborescens*, the latter a large labiate plant, covered in every part with a clammy and scented exudation. I also found many of the productions of the Sierra de Mijas, such as *Armeria alliacea* and *Echium albicans*.

The diverging point of the water does not exceed 1800 feet of absolute height, and is not more than 800 feet above Mouda; from it, but a very small extent of sea-view can be gained at the extremity of the valley, because of the many projections which hem it in on each side. On the northern slope, near the summit, few plants were in flower; but I had no sooner gained the opposite declivity, than I found myself in the midst of flowery bushes of *Genista hirsuta* and *G. Hanselæri*. A party of muleteers whom we encountered, were struck with natural surprise when they saw me gathering huge bouquets of these thorny plants, and open-mouthed did they swallow the tales which Antonio related to them on this subject, with all his wonted gravity. This valley reminded me of certain sites in the maritime Alps, and among others, the road by which the traveller descends from Tende to

Fontan. I collected *Vicia disperma, Arenaria retusa* and *Anagyris fœtida*, growing plentifully by the roadside. Lower down, we came to the village of Ojen, which is situated in the middle of the gorge, one of the most picturesque positions that can be imagined. Seen from below, its houses seem to hang over a barely descried precipice, curtained with masses of verdure.

It was near sunset when we reached the end of the valley; and on rounding the last heights, discovered the expanse of ocean before us and the town of Marbella, into which we descended by long uncultivated slopes. This was a flourishing place in the time of the Moors, and owed its prosperity to the now entirely discontinued culture of the *Sugar-cane*. Decay has fallen upon the town, but its romantic position and noble trees contrast admirably with the ruined edifices that mark its ancient grandeur. On the sea-shore, I observed the remains of an old castle, which long defended itself against the French during the war of independence, and of which the garrison finally escaped on board an English ship.

As there was nothing in Marbella to induce me to remain, I set off next morning for Estepona, along a road where *Aristolochia Boetica* and *Smilax Mauritanica* festooned the enormous overshadowing *Lentisks*. I also gathered *Physalis somnifera*, and specimens from the *Ricinus*, which here attains the stature of a tree. For half a league from the town, the land was partially cultivated, and a few houses might be seen scattered here and there; but farther on, every trace of man had disappeared, and the country was a vast savannah, dotted with *dwarf palms* and bushes of *Cistus*, and stretching with an easy descent from the foot of the Sierra Bermeja to the sea. The agriculture which once overspread these plains, might still be pursued to the greatest advantage, for the country is intersected in all directions with streams, flowing accessibly in comparatively shallow channels. On the sandy ground, and among the shrubs, *Helianthemum halimifolium* grew in particular abundance. I collected *Armeria plantaginea, Pterocephalus Lusitanicus, Helminthia comosa, Ononis Picardi*

and *mitissima, Linum tenue, Linaria viscosa,* and *Inula Arabica,* the latter affecting the damp spots; and a host of *Gramineæ,* with the most elegant of that family, *Briza maxima,* waving its golden spikes in the lightest breeze, while the *Oleander* fringed the brooks, and pointed out their course from afar, by wavy lines of the most delicate pink.

As following the sea-shore I drew nearer to Gibraltar, that terror of Spanish Custom-house officers, the towers of observation and parties of posted carbineers became more numerous. Five or six occur between Marbella and Estepona, and they are the only inhabited spots which break the solitude of the country. At one of them I found an old soldier, who had travelled in France, and who was delighted, after many long years, to see an individual who spoke the language of that country, and to whom he could sing some French songs, of which the pronunciation was most curiously altered in his mouth. It has often been my chance, in making excursions, to meet with peasants and shepherds who had been in France as prisoners of war, or at the time of the battle of Toulouse, and they all spoke with affection and respect of my native land and its inhabitants, extolling us often at their own expense. Nowhere did I find, even in Andalusia, a trace of that spirit of hate and fanaticism prevalent among the Spaniards during the French invasion.

Estepona is a pretty little town, built on the beach; it is lively, modern, and brilliantly white; for every house, and even the pavement, being whitewashed anew, monthly at least, you might fancy, at the first look, that the whole was hewn out of chalk; though if the stranger leaves the two or three narrow streets which join the shore, and turns his steps towards the hills, he will find nothing amid the prickly pears but paltry, shapeless mud-huts, so frail and ill-built, as to afford no shelter, and to be only habitable in this settled and mild climate by the lowest orders of the people. I halted at the Posada near the entrance of the town, and took possession of a large apartment, with windows looking upon the sea. As if the vicinity of that English town, of which the rock

might be descried six leagues off, had exerted an advantageous influence on the Posada of Estepona, I found every thing well managed and beautifully neat.

I prepared for the ascent of the Sierra Bermeja next day, particularly eager to explore it, because I wished to gather a pine, of which I had observed a fruitless branch in the herbarium of M. Hanselaer, at Malaga, and which had appeared to me an undescribed species. All the people of Estepona knew it under the name of *Pinsapo,* and told me that the tree is constantly used in religious processions and festivities, because its foliage is elegant, and the branches being placed at right angles, even to the last ramifications, present the form of so many crosses and crosslets. They pointed out the woods that consist of this tree, discernible from the town, even so high as the summit of the Sierra, by their dark green hue, contrasting with the pale and lively transparent verdure of *Pinus pinaster,* clothing the lower slopes.

To reach the foot of the mountain, it is necessary to climb over a succession of small vineyard-covered hills furrowed by long ravines, which rain-water and streams have formed in its light and shifting soil. The situation is warm, and I noticed several fine plants, especially *Umbelliferæ,* but deferred their examination till the following day. About 1000 feet up, the vine disappeared, and was succeeded by lovely bushes of *Cistus ladaniferus,* covered with large snowy flowers, as big as hedge-roses. The leaves and branches of this shrub are imbued with a clammy aromatic substance, which scents the atmosphere and is much prized in Spain for curing wounds; while the deep but rich verdure of its foliage recalled the *Alp-rose,* or *Rhododendron* of Switzerland. *Erica umbellata* and several other heaths in blossom, as E. *scoparia* and *arborea,* and our own *Calluna,* adorned the ground. Rather higher, at the very base of the Sierra, we reached a grove, consisting of *Quercus Suber* and Q. *Lusitanica,* intermingled with a few *Pinasters.* There, amid *Myrtles, Arbutus,* and *Cistus,* grew many strange, and to me unknown, species, the most conspicuous being, assuredly, *Digitalis laciniata,* bearing a

crown of glossy, slightly cleft leaves at the top of a bare, woody stalk, 4 or 5 feet high, and at the very extremity, a spike of orange or rusty-coloured flowers. *Linum Narbonense, Adenocarpus Telonensis, Genista triacanthos*, and *Teucrium fruticans*, were also common, together with a pretty and new *Scorzonera* with linear leaves. A stream that hurried down from a gorge in the mountain, traversed this spot, and a few cottages, built in the valley near it, sheltered with trees and commanding fine glimpses of the sea, appeared as so many abodes of peace and felicity.

The vegetation of the Sierra Bermeja is very different from that of the other mountain chains in the country, its peculiarities being due, partly to the woods which clothe it, and partly to the nature of its rocks, consisting of a kind of sandstone and not of chrystalized limestone. As it is the nearest to Africa, so it seems to resemble the secondary ranges of the Atlas mountains. I saw the lovely *Stæhelina Boetica* beginning to expand its delicate pink flowers, *Genista hirsuta* forming thick and roundish bushes, and *Lithospermum prostratum*, which indeed is common in all the mountainous parts of Spain, and was here decked with corollas, white, red, or purple, according to the date of their expansion. My guide told me many wonderful tales of the virtues of this last plant, which the country people call *yerba de las siete sangrias*, because its administration is considered of equal virtue with severe blood-lettings. *Pinus pinaster*, which grew very stunted at the foot of the mountain, attained at this elevation the stature of a tree, 30 or 40 feet high, the trunk bare of branches below, and the leaves very long, and stiff, and sharp, with the scales of its cones much warted. At a height of 2,000 feet we halted near a burning spring, charmed with the shade which the traveller so rarely sees on the mountains of the Peninsula, and enjoying the murmur of the stream and of the wind amid the leaves. *Anagallis tenella, Scirpus nigricans*, and S. *acicularis*, were growing in the water, and splendid bushes of *Erica ramulosa* and *Dorycnium hirsutum* all around.

Up to this point we followed a tolerably easy path, leading into the Serrania de Ronda, over one of the lower points of the chain; but here I left Antonio and my guide, who were to reach the ridge and to meet me on the summit, and struck into a grove of firs on the left, where I gathered *Arenaria montana*, *Herniaria incana*, *Euphorbia verrucosa*, *Ceterach Marantæ*, *Ruscus aculeatus*, and *Aphyllanthes Monspeliensis;* but many of these, and also *Centaurea Tagana*, *Chamæpeuce Hispanica*, *Scabiosa tomentosa*, and a fine species of *Cephalaria* were not yet in flower. At a height of about 3,000 feet, the trunks and boughs of the trees were fringed with the lichens of temperate Europe, *Usnea barbata*, *Physcia furfuracea*, and P. *glauca;* and I also detected in chinks of the rocks, a particularly pretty and delicate kind of *Saxifrage*.

For about the last fourth of the ascent, the firs continued to diminish, and they finally disappeared, being replaced by the *Pinsapo*, which I had thus the satisfaction of examining closely. The branches with which the trunk of this tree are furnished from the very base, recalled our common spruce fir; but the remarkable and fleshy thickness of the short leaves, with their cylindrical arrangement on the branches, forbid its being referred to any known species. I hunted for cones, in order to decide the point, but was unable even to find a scrap of one, so I was compelled to defer my investigation to a future period. Among mossy rocks, the elegant *Cistus populifolius* displayed its snowy blossoms, in spite of the chilly coldness that prevailed in the mountain region. We are apt to suppose that the genus *Cistus* is confined to the warmer parts of the Mediterranean region, but such is not the case with this species, nor with C. *laurifolius*, both of which I have gathered at an elevation of 6,000 feet, in spots where snow lies unmelted during four or five months of every year. I am satisfied they would endure uninjured our winters in central Europe. Two pretty *Liliaceæ* grew here, *Ornithogalum umbellatum*, and a *Fritillaria*, with its brown petals banded longitudinally with yellow.

It was nearly five o'clock in the afternoon when I reached the summit. Nothing was in bloom but *Ulex australis*, *Lithospermum prostratum*, *Thymus diffusus*, *Valeriana tuberosa*, and *Alyssum serpyllifolium;* other plants, as *Serratula Boetica*, *Centaurea acaulis*, *Tencrium aureum*, were hardly in bud. Two barometrical observations, which I took on this day and again a fortnight later, gave the elevation of the highest point at 4741 feet, and enabled me to acquire a general idea of the Sierra Bermeja; I saw it extending and ramifying towards Marbella, sloping always lower and lower from the spot where I stood, clad in all directions with pine forests, and contrasting in hue with the bare and calcareous rocks which surround the latter town. South-easterly it terminates in steep descents, and thence, towards San Roque, an undulated country intervenes, traversed by the river Guadiaro, and also crossed by the road leading to Gibraltar, which my eye could follow up to that city. To the north, the view was bounded by a labyrinth of arid mountains, called the Serrania de Ronda, and by the Sierras de la Nieve and Saint Christobal, which rose above the rest. Neither Ronda nor its platform was discernible, on account of a lofty ridge south of the town. As for the coast of Africa, it was seen for a much greater extent and far more distinctly than from the Sierra de Mijas. The wind blew so cold, that it would not allow me to remain long on the peak, and night also came on, suggesting the fear that I might be unable to rejoin my companions; but following the direction of a bright fire which I descried among the trees, I succeeded in finding them; the blaze proceeding from a fir which they had kindled, and round which they had encamped, full of uneasiness on my behalf, and proposing to start with the earliest daylight, and search for me all over the mountain. The night was splendid, and I felt strongly tempted to remain where I was, that I might have a long day's botanizing. But our provisions were consumed, and cold and hunger combined to drive us to the town. As we descended, we heard distinctly the signal-gun from Gibraltar, a distance of full twenty-one miles in a straight line from the place where we stood.

At ten at night I reached Estepona, fatigued by the long and exhausting day, though well pleased with its results. The following morning I despatched my servant to the foot of the Sierra, that he might collect specimens of *Digitalis laciniata*, and other plants which I had been unable to gather the previous day, while I myself explored the adjoining hills. The sun had already scorched up most of the annual species; but I found instead, several *Umbelliferæ*, *Elæoselinum fœtidum*, *Thapsia Garganica*, *Daucus crinitus*, and *Magydaris panacifolia*. Vegetation was quite green in the valleys, where, round the vine-dressers' huts, which are generally placed by a stream, and shadowed with fig-trees, grew *Ononis pendula*, *Dorycnium hirsutum* and D. *rectum*, with fine species of *Vicia* and *Lathyrus*, on the margin of the rivulets. Near the town, the meadows were surprisingly green, I could have thought myself in northern Europe; but this idea was quickly dissipated by an examination of the plants which composed the sward, namely *Hedysarum capitatum* and *Plantago Serruria*, mingled with *Orchis coriophora* in flower.

M. Hanselaer, who has lived nearly nine years at Estepona, discovered on these hills a quadruped, new to Europe; the *Viverra Ichneumon*, hitherto considered to be confined to Egypt and some few spots in Barbary. He saw it in burrows; the country people call it *Meloncillo*. The more we explore this southern region, the more numerous will the analogies be found between it and northern Africa; a circumstance quite to be expected, from the similarity of climate and temperature. Everything seems to prove that the two continents were formerly joined together, where the Straits of Gibraltar now sever them, and that an inland sea, which filled the place of the central plains of the Peninsula, divided those regions from the remainder of Europe.

(*To be continued.*)

Description of a New Genus of COMPOSITÆ, *and a New Species of* PLANTAGO, *from the Mountains of Tasmania, by* J. D. HOOKER, M.D. R.N. F.L.S., *with two Plates.*

(TABS. XIII. XIV.)

SCLEROLEIMA, *Hook. fil.*

Capitula solitaria, sub 4-flora; flosculis omnibus tubulosis; masculo solitario. *Involucrum* sub 4-phyllum, squamis 1-serialibus, chartaceo-coriaceis, obovatis vix acutis. *Receptaculum* nudum, angustum, planum.—FL. MAS. *Corolla* infundibuliformi-tubulosa, profunde 4-dentata, dentibus erectis acutis concavis. *Stylus* validus, exsertus, apice globoso-capitatus, obscure bilobus. *Antheræ* latiusculæ, apicibus exsertis, læviter connexæ, basi breviter bi-auriculatæ. *Achenium* parvum, calvum, obscure tetragonum, lineari-obovatum.—FL. FŒM. *Corolla* tubulosa, cylindracea, basi globosa, ore profunde 4-dentato, dentibus subæqualibus patentibus. *Stylus* elongatus, exsertus, apice breviter bifidus. *Achænium* obovatum, superne truncatum, tetragonum, angulis subacutis, carinatis, omnino calvum.—Herba *pusilla, Tasmanica, habitu* Forsteræ uliginosæ, *densissime cæspitosa.* Caules *compacti, una cum foliis angulati,* radices *crassas fibrosas demittentes.* Folia *arcte sub* 4-*fariam imbricata, coriacea, ovato-subulata.* Capitula *sessilia, fructifera elongata.* Flores *minimi, valde inconspicui.*

SCLEROLEIMA *forsteroides*, Hook. fil. (TAB. XV.)

HAB. Tasmania; forming extended patches on the summit of Mount Wellington and other mountains, *R. Brown, Esq., R. C. Gunn, Esq., J. D. H.*

A very singular little plant, forming a distinct genus, though one very closely allied to the *Ceratilla*, Hook. fil., of Campbell's Island, *Trineuron*, Hook. fil., of Lord Auckland's Group, and *Abrotanella*, Gaud., of Cape Horn and the Falkland's Islands. All are genera belonging to a section or

group of *Compositæ*, very near the *Hippieæ*, Less., but which may be readily distinguished by their perennial stems, their very peculiar habit, by the absence of pellucid glands and by their being quite inodorous. The present is most nearly allied to the Antarctic American genus, *Abrotanella*, of the three just alluded to, especially in the paucity of involucral scales and florets, the densely packed stems, imbricating short leaves. It differs from the *Abrotanella emarginata* in the form of the female florets, and especially of the achænium. This is, however, strictly the representative of that plant, occurring along with several other equally well marked Tasmanian representatives of the Antarctic American Flora, only on the higher parts of the island, where a vegetation is found in some degree analogous to what we should expect to find did Tasmania stretch far south into the Antarctic Ocean. Other such representatives belong to the genera, *Astelia*, *Fagus*, *Hierochlœ*, *Acæna*, *Oreobolus*, *Carpha*, *Tasmania*, *Milligania*, and others.

This little plant forms immense broad and flat green patches on the top of the Tasmanian Mountains, sometimes extending for yards, surrounded by *Restiaceæ* and the *Oreobolus pumilio*, Br. In general appearance it much resembles the *Forstera uliginosa* of Cape Horn, but is larger, and forms much broader patches.

Descr.—*Stems* densely tufted, erect, sparingly branched, covered throughout their length with leaves; the *branches*, together with the leaves, angled from the mutual pressure; rooting by sending down long thick fleshy fibres. *Leaves* densely imbricating, sub-quadrifarious, suberect, short, about $\frac{1}{3}$ inch long, broadly sheathing at the base, the rest subulate, acuminate, very thick and coriaceous, the margins obscurely cartilaginous and serrulate, bright green. *Capitule* very small, when in flower sessile amongst the uppermost leaves, on a short terminal peduncle, which elongates after flowering. *Involucral scales* erect, about 4 or 5, forming together a subcampanulate cup; much shorter than the florets, or even than the achænia. *Florets* about 4,

the 3 outer female, the inner larger and male. *Perianth* of male flowers clavate, 4-dentate, the teeth large, erect; of the female, shorter, narrower, tubular, and also cleft; the teeth spreading. *Stamens* nearly free, ½ exserted. *Styles* all exserted; of the male capitules 2 lobed, of the female bifid. *Achænia* all larger than thein volucral scales, short obovate, tetragonous, with the angles keeled, truncated at the broad apex, its coat coriaceous. *Seed* broadly ovoid.

PLATE XIV.—FIG. 1. Tuft of the natural size; *f.* 2. capitulum; *f.* 3. female flower; *f.* 4, male ditto; *f.* 5. stamen; *f.* 6. achænium; *f.* 7. seed; *f.* 8. vertical section of achænium; *f.* 8. embryo; *f.* 10. and 11. leaves:—*all magnified.*

PLANTAGO *Gunnii*, Hook. fil.; pumila, caule gracili folioso, foliis ovato-oblongis subacutis integerrimis basi in petiolum vaginantem attenuatis supremis erecto-patentibus superne pilis elongatis articulatis crinitis, subtus glaberrimis, pedunculo brevissimo terminali 1-floro, filamentis brevibus, capsula 2-loculari esperma. (TAB. XIII.)

HAB. Tasmania, in tufts of *Scleroleima forsteroides*, (just described), very rare, *R. C. Gunn, Esq.*

This is decidedly the smallest species of the genus, barely distinguishable amongst the tufts of *Scleroleima* it inhabits: it is further the only truly single flowered species I have seen, the P. *monanthos* often bearing two, or several flowers.

DESCR.—*Stems* solitary or a few together, growing in tufts of other plants, 1-2 inches long, very slender, leafy, for almost the whole way up. *Leaves* ¼ inch long, loosely imbricating. *Petiole* as long as the lamina, semi-amplexicaul, smooth; *lamina* ovato-oblong, concave, smooth below, above covered with long whitish jointed hairs. *Peduncle* very short, pubescent. *Bractea* concave and one-flowered; *capitulum* hidden amongst the uppermost leaves; *calyx-leaves* as long as the bractea, elliptical, oblong, acute. *Corolla* with a

short tube and 4 spreading segments as long as the tube. *Stamen* exserted; the *filaments* very short; *anthers* linear-oblong. *Capsule* small, exserted, 2-celled; *cells* 1-seeded.

PLATE XIII.—FIG. 1. Plant of the natural size; *f.* 2. corolla and stamens; *f.* 4. peduncle and fruit-bearing capitulum; *f.* 5. seed; *f.* 6. section of the same; *f.* 7. leaf: *all magnified.*

Remarks on the New Species of MUSCI *from Quito and Swan River, indicated by* DR. TAYLOR *in the London Journal of Botany*, Vol. V. p. 41, *by* WILLIAM WILSON, ESQ.

(*With Two Plates,* TAB. XV. XVI.)

The writer of these remarks had devoted much time to the investigation of most of the species here enumerated before Dr. Taylor's publication appeared. In not a few instances his conclusions were at variance with those of Dr. Taylor, and he has since carefully reviewed every species, for which task his long and familiar acquaintance with Sir W. J. Hooker's Herbarium has given him superior advantages. He has also gladly availed himself of the specimens most liberally lent to him by Dr. Greville and Dr. Taylor for this purpose.—He offers his remarks, with deference, to assist those who may hereafter study the synonymy and affinities of this tribe.

Phascum cylindricum.—Intermediate forms rather show this to be only a variety of P. *tetragonum.*

Gymnostomum linearifolium is *Zygodon cyathicarpus,* (Montagne, in Annales des Sciences Nat. Aug. 1845, p. 106!)

Gymnostomum brevicaule seems scarcely different from *Pottia minutula* var. *γ. obtusa,* (Bruch et Schimper).—The leaves are perhaps more elliptical, the nerve scarcely excurrent, and the operculum is apiculate.

Gymnostomum inflexum appears to be the same as *Weissia mucronata*, (Nees et Hornsch.), except in the absence of a peristome.

Gymnostomum apophysatum, is a *Physcomitrium*, foliis ovatis acuminatis subintegris evanidinerviis, capsula clavata.

Leptostomum squarrosum, has a double peristome, and the habit is that of *Paludella*. The sulcate capsule, however, shews it to be an *Aulocamnion*.—(A. *flexifolium*, Hook. et Wils. MSS.), foliis pentastichis flexuosis ovato-oblongis apiculatis subsolidinerviis. (Tab. XV. G.)—It differs from A. *pentastichum*, (Montagne), in the shorter flexuose leaves, and from *Paludella squarrosa* in the absence of serratures, and in the striated capsule.

Brachymitrium Jamesoni, (Tab. XV. A.), belongs to the order of *Splachnaceæ*, and appears to be a species of *Eremodon*, (Bridel), or perhaps of *Tayloria*, (Bruch et Schimper), from which it differs merely in the scabrous calyptra. It is allied to *Tayloria Rudolphiana*. Another curious species has been sent from South America by Mr. Lobb.*

* *Eremodon spathulatus*, (Hook. et Wils.); foliis spathulatis argute serratis evanidinerviis siccitate undulato-crispatis, seta breviuscula, capsula cylindrica exapophysata, operculo conico-apiculato brevi, calyptra mitriformi hirta basi appendiculata. (Tab. XV. B.)

Hab. South America. *Mr. Lobb*, 105.

Stems half an inch long and more, with purplish radicles. Leaves not expanding in water. Teeth of the peristome in 8 pairs, horizontal, pale, not reflexed when dry. No annulus. The inflorescence is monoicous, the male flower capituliform.

In all the *Splachna* hitherto examined, the sporules are arranged in a very peculiar manner: they are lodged in cells radiating from the columella, to the number of eight or nine. The knowledge of this fact supplies a ready solution of the difficulty mentioned by Dr. Montagne in Annales des Sciences Nat., Aug. 1845, 119. *Weissia (Encamptodon) perichætialis*, (Mont.) is evidently a Splachnoid Moss, of which he remarks: "Quelle n'a pas été ma surprise, en cherchant à connaître les spores, de trouver à leur place, des espèces de gemmes analogues à celles qu'on rencontre dans les corbeilles des Marchantiées. Toutes les urnes que j'ai ouvertes en étaient complètement remplies. Ces gemmes sont cuneiformes ou paral-

Grimmia leiocarpa, is G. *leucophœa*, var. capsula subrotunda.—G. *campestris* is not distinct from G. *leucophœa.*

Grimmia cygnicolla, is G. *pulvinata* var. *β. obtusa*, (Br. et Sch.)

Orthotrichum elongatum.—Dr. Greville's specimen comprises two species, one with a smooth capsule and eight cilia, the other with a substriated capsule and sixteen cilia. The first is closely allied to O. *leptocarpum*, (Br. et Sch.)

Schlotheimia oblonga, is truly *Orthotrichum longifolium*, Hook. Musc. Exot. Though this *Moss* has a double peristome, the calyptra shows it to belong to *Macromitrium* (Bridel.)

Zygodon Drummondii.—All the specimens sent to me by Dr. Taylor under this name certainly belong to *Codonoblepharum Menziesii*, (Schwaegr. Suppl. t. 137), and to this Dr. Taylor's description of the leaf and operculum seems to refer. Of the *Zygodon* itself we have seen no specimen. It is probably the same as a *Moss* from New Zealand (Menzies, n. 66) which Dr. Taylor has sent under the name of "*Codonoblepharum Menziesii*," but which is *Zygodon angustifolius*, (Hook. et Greville, MSS.) Probably Mr. Menzies distributed both *Mosses* under one name, since there is no counterpart in the Hookerian Herbarium of what was sent to Schwaegrichen.

Didymoden luteus, is nearly allied to D. *squarrosus*, (Hook.); it appears to be the same as *Neckera viticulosoides* (P. Beauv.), or rather one of the two *Mosses* given by P. Beauvois under that name.

Barbula Jamesoni, allied to the last, has the peristome of *Trichostomum* (Br. et Sch.), and in habit is very unlike a *Tortula.*

lélogrammes. Je n'ai pas rencontré d'autre moyen de propagation. On ne pourra jamais regarder ces organes comme de vraies spores." In this case the cuneiform masses consist of the cellular tissues containing a number of spores in a state of aggregation; the only difference being that the cellular tissue is not, as in ordinary cases, absorbed or broken up into solitary cellules. In sections of the half-ripe capsule of *Splachnum sphæricum* the radiating lines of spores are very conspicuous.

Barbula inæqualifolia.—Foliis ovato-lanceolatis obtusis margine revolutis, peristomii dentibus bis contortis.—(TAB. XV. D).

Barbula replicata.—Foliis lanceolato-subulatis obtusiusculis brevissime mucronulatis siccitate contortis.—(TAB. XV. C.)—Leaves narrower and longer than in the last.

Barbula rectifolia, is *Barbula gracilis* (Schwaegr.), *var.* seta longiori.

Barbula erythrodonta, foliis lanceolatis acuminatis carinatis marginatis.—(TAB. XV. F.)—A very remarkable *Moss*, with much of the habit of *Leptotheca speciosa* (Hook, et Wils.)—The teeth of the peristome united below into a short tube.

Barbula torquata, allied to *Tortula unguiculata*, but the leaves more acute. When dry it resembles B. *replicata*, to which it is also allied.

Barbula crassinervia, is *Tortula recurvata*, Hook. Musc. Exot. t. 130, *var.* seta breviori.—A specimen from the Cape, (Mund, n. 30), is still smaller, and intermediate between this and T. *parvula* (Hook. et Grev.), which does not appear to be a distinct species. All these have certainly the peristome of *Tortula*, but are probably only a more developed state of *Desmatodon nervosus*, (Br. et Sch.)—The leaves and inflorescence are exactly the same.

Barbula rufiseta, is *Tortula Australasiæ*, (Hook. et Grev.), which may be only a state of *Tortula vinealis*, (Bridel).—In this *Moss* the peristome is very slightly twisted, and approaches very closely to *Trichostomum* in its structure.

Bryum pungens, B. *inæquale*, and B. *multicaule*.—These three are most closely allied, the two latter especially seem to belong to the same species. In B. *pungens* the leaves are more acuminated and less crowded, but no essential difference is perceptible. The nerve of the leaf in all three ceases below the apex.

Bryum tenuissimum, is *Schistidium pulchellum* (Hook. et Wils.), but not a *Schistidium* as now defined by Bruch and Schimper. For this and the allied species, S. *arcuatum*, the new generic name, *Eccremidium*, is proposed for a genus cha-

racterized by the short, thick, arcuate seta, and pendulous capsule. *Phascum exiguum* (Hook. et Wils.), may prove to belong to this genus, when examined in a sufficiently mature state.

Bryum campylothecium, differs from B. *Billardieri*, (Schwaegr.), in the more concave leaves with longer points and larger areolæ; but after comparing it with B. *Billardieri* of Bruch and Schimper (which appears to be B. *Canariense*, Schwaegr.), from Sardinia and Istria, and with B. *Canariense*, (Schwaegr.), from the Canaries, it seems expedient to consider all these as varieties of one species.

Bryum creberrimum, appears to be only a variety of B. *obconicum* (Hornsch.), with longer setæ and smaller capsules than usual. The elongated surculi furnish no character, and are not found in all the specimens sent by Mr. Drummond from the Swan River.

Bartramia strictifolia, is B. *stricta* (Bridel).

Bartramia integrifolia, scarcely differs from B. *pendula* (Hook.), except in the absence of serratures on the leaf, and may be only a variety; the inflorescence is dioicous, the perigonial leaves are ovate, spreading.

Bartramia angulata, is believed to be B. *rufiflora* (Hornsch. Fl. Bras.) The leaves are quinquefarious.

Brachymenium subrotundum, (Tab. XVI. H.), has the peristome of *Acidodontium*, of which another new species has been gathered by Professor Jameson.*

Funaria subnuda, is F. *physcomitrioides* (Montagne, Crypt. Nilgh.), *var.* foliis minus acuminatis.

* *Acidodontium seminerve* (Hook. et Wils.), foliis erectis ovato-lanceolatis acuminatis subintegris seminerviis, seta elongata, capsula pyriformi-clavata horizontali, operculo hemisphærico, peristomio albido.—(Tab. XVI. I.)

Forests of the Andes, *Professor Jameson*, n. 328, and Pichincha, 327? (fruit immature).—This has the habit of *Brachymenium*. Seta 2 inches long. Leaves shining green, almost piliferous, not shrinking when dry. Inflorescence dioicous.

Funaria glabra, may be a distinct species, but the characters are very much those of F. *Fontanesii.*

Schistidium Drummondii.—If this *Moss* had a nerve, as stated, no question would exist concerning its separation from *Anictangium imberbe.* No such character exists in A. *australe* (MSS. nob.), which is only a variety of A. *imberbe.*

Fabronia incana, is F. *tomentosa* (Hook. et Wils. Ic. Pl. t. 739), and also F. *Hampeana* (Sonder in Hampe, Ic. Musc. t. 13). The latter name was published the first.

Pterogonium Jamesoni is *Neckera leptocarpa,* (Hook. et Wils., MSS.)—(Tab. XVI. L.)—Certainly a *Neckera,* allied to N. *Beyrichii,* but the leaves larger and serrulate above, and the perichætial leaves closely sheathing the base of the short seta, capsule long and narrow, when old pellucid, so as to show the columella within.

Neckera Jamesoni, may perhaps be a variety of N. *Douglasii,* (Hook.)

Neckera luteovirens, foliis ovato-lanceolatis acuminatis, operculo conico-subulato, calyptra mitriformi glabra coriacea rufo-fusca.—(Tab. XVI. N.)

Hookeria erectiuscula, allied to *Neckera scabriseta* (Schw.), from which it differs in the longer seta, and wider more symmetrical leaves.

Hookeria chloroneura, still more like *Neckera scabriseta,* of which it may even be a small slender variety, with the nerves of the leaf more evident than usual.

Leskea superba, (Tab. XVI. M.)—Perhaps two species are included. The principal specimen from the westerly declivity of Pichincha is identical with *Hypnum flagelliforme* (Humboldt), in Herb. Hook.

Leskea gymnopoda.—By means of intermediate specimens gathered in Brazil by Mr. Gardner, it would appear that this is only a state of *Hypnum expansum* (Taylor).

Leskea angustata, is apparently the same as *Pterogonium consanguineum* (Montagne in Crypt. Nilgh.) which may be only a variety of P. *nervosum,* whose peristome is that of *Leskea.*

Leskea imponderosa, is *Cryphæa helictophylla* (Montagne in Ann. Sc. Nat. Aug. 1845), which may be only a variety of *Neckera fuscescens* (Hooker).—Another *Moss*, sent by Professor Jameson, but unfortunately not in fruit, is remarkable for a far more slender habit than L. *imponderosa*.*

Hypnum Jamesoni, may be a new species; it is H. *asperum*, (Hook. MSS. in Herb).

Hypnum Drummondii, is *Leskea homomalla*, (Hampe, Ic. Musc. t. 6). The peristome, however, is certainly that of *Hypnum*. There is not any annulus in this species.

Hypnum lepturum, is probably a *Leskea*, foliis subsecundis integerrimis nitentibus basi laxe reticulatis vix ac ne vix margine reflexis.

Hypnum microcladum, (*Leskea ?*) The capsule of one specimen is quite erect; no apophysis is apparent, nor any reflexed margin to the leaf. It is nearly allied to *Hypnum hyalinum* (Schwaegr.), which may also be a *Leskea*.

Hypnum expansum, not different from *Neckera longirostris* (Hooker), which is believed to be a *Leskea*, to which genus other *Mosses*, described as *Neckeræ* in *Musci Exotici*, should also be referred. The smaller specimen in Herb. Grevill. is apparently different, and much resembles H. *neckeroides*, (Hooker), but has a shorter nerve.

Hypnum scariosum, may be only a variety of H. *Megapolitanum*. The principal difference is in the slightly-reflexed margin, and more filmy texture of the leaf.

Hypnum solutum, is H. *toxarion* (Schwaegr.), according to

* *Cryphæa ? tenuissima* (Hook. et Wils.), caule pendulo capillari flexuoso elongato ramoso, ramis patentibus filiformibus subsimplicibus, foliis distantibus erectis ovato-acuminatis serrulatis seminerviis, perichætialibus quadruplo longioribus attenuatis.—(Tab. XV. E.)

Woods, Baños, *Jameson*.

The stems of this exceedingly delicate *Moss* are a foot long and more, not thicker than a hair, thinly covered with very small scattered leaves, disposed in $\frac{3}{8}$. The perichætia are very conspicuous. The remains of an old capsule, which may have belonged to this *Moss*, showed a Neckeroid peristome.

Dr. Montagne. The specimens described by Schwaegrichen from St. Domingo are without fruit, (vid. Suppl. I. 2, p. 283).

Daltonia ovalis, (See p. 66, and TAB. XVI. K.)—The peristome of this and of D. *splachnoides* is sufficiently like that of *Hookeria* to admit of their being placed in the same genus, and a connecting link is furnished by *Hookeria nervosa*, (Hook. fil. et Wils.)—The calyptra is not a peculiar character, being found in several undoubted *Hookeriæ*, e. g. H. *paradoxa* (Mont.), H. *Dicksoni* (Hook.), H. *flaccida* (Hook. fil. et Wils.), and H. *Magellanica* (P. Beauv.)

Fissidens pygmæus, not the *Moss* of Hornsch. in Linnæa, vol. 15, p. 147 (1841), but nearly allied.—F. *pygmæus*, (Hornsch.), is a smaller species, with an erect capsule. In Dr. Taylor's *Moss* it is inclined, the leaves not obviously obtuse, inflorescence monoicous.

EXPLANATION OF PLATE XV.

A. *Eremodon Jamesoni*, (See p. 44,* under *Brachymitrion*)— 1. leaf; 2. capsule; 3. calyptra; 4. peristome; *ten times magnified*

B. *Eremodon spathulatus*, (Hook. et Wils.),—Similar parts, *magnified ten times.*

C. *Tortula replicata*, (See p. 49, under *Barbula*).—1. leaf, *ten times magnified*; 2. apex of leaf, *forty-five times magnified.*

D. *Tortula inæqualifolia*, (See p. 49, under *Barbula*).—1. leaf; 2. capsule; 3. perichætium; *all ten times magnified.*

E. *Cryphæa tenuissima*, (Hook. et Wils.)—1. portion of a stem with perichætium, *ten times magnified*; 2. perichætial leaf, *ten times magnified*; 3. stem-leaf, *forty-five times magnified.*

F. *Tortula erythrodonta*, (See p. 50, under *Barbula*).—The leaves and capsule; *ten times magnified.*

G. *Aulocamnion flexifolium*, (Hook. et Wils.), (See p. 43,

* These references are to Dr. Taylor's descriptions at the respective pages.

under *Leptostomum squarrosum.*—The leaves and capsule; *ten times magnified.*

PLATE XVI.

H. *Acidodontium subrotundum,* (See p. 56).—Leaves and capsule, *ten times magnified*; 1. stem-leaf; 2. branch leaves; 4. portion of peristome, *highly magnified.*

I. *Acidodontium seminerve,* (Hook. et Wils.).—The leaves, capsule and peristome, *ten times magnified.*

K. *Daltonia* (*Hookeria?*) *ovalis,* (See p. 66).—Leaves, capsule, peristome, and calyptra, *ten times magnified.*

L. *Neckera leptocarpa* (Hook. et Wils.), (See p. 59, under *Pterigonium Jamesoni*).—Leaves, capsule, calyptra, perichætium 3, and peristome 5, *all ten times magnified.*

M. *Leskea superba,* (See p. 61).—1. stem-leaf; 2. portion of a branch, *both ten times magnified.*

N. *Neckera luteo-virens,* (See p. 59).—Leaf, capsule, and calyptra, *ten times magnified.* Of the two latter, as also of *Cryphæa tenuissima,* only a part of the whole specimen is introduced of the natural size.

Contributions towards a FLORA OF BRAZIL, *being the characters of several New Species of* COMPOSITÆ, *belonging to the tribe* EUPATORIACEÆ;—*By* GEORGE GARDNER, Esq., F.L.S., *Superintendent of the Royal Botanic Gardens, Ceylon.*

(*Continued from p.* 242.)

ISOCARPHA, *R. Br.*

4837. Is. *fastigiata*; caule herbaceo erecto ramoso, ramis teretibus striatis pubescenti-tomentosis, foliis oppositis in petiolum basi longe attenuatis superne oblongis obtusis pauce dentatis vel subintegris triplinerviis membranaceis

glabris pellucido-punctatis, capitulis paucis ad apicem ramulorum corymbosis breviter pedicellatis 20-25-floris.

Hab. In moist open places in the Diamond District, Brazil. Fl. in July.

Herba 2-3 pedalis. Folia 2-2½ poll. longa, 3-4 lin. lata. Involucrum campanulatum; squamis biseriatis, oblongo-lanceolatis, acutis, 3-nerviis, 1½ lin. longis. Receptaculum conicum, paleaceum, paleis lineari-lanceolatis, acutis, 1-nerviis. Corollæ tubulosæ, ad faucem ampliatæ, extus glanduloso-puberulæ, lineam circiter longæ, albæ. Styli rami longe exserti, cylindrici, obtusi. Achænium oblongum, nigrum, acute pentagonum, glabrum, epapposum.

Near I. *atriplicifolia*, R. Br., but differs from it in the shape of the leaves, and, according to the description by Linnæus, in the "Amænitates Academcæ," vol. iv. p. 329, in the paleæ being entirely glabrous, not villous at the apex. Auricular stipulæ are said to exist at the base of the leaves in I. *atriplicifolia*. In the present species there is a very small pair of leaves nearly on the same plane and alternating with the others, and of the same shape, which gives them the appearance of stipulæ. Those in I. *atriplicifolia* are no doubt of a similar nature, only differing in shape.

4839. Is. *eupatorioides*; caule herbaceo erecto ramoso, ramis teretibus pubescentibus, foliis petiolatis ovato-oblongis vel oblongo-lanceolatis utrinque acutis vel rariter obtusiusculis supra glabriusculis subtus pubescentibus grosse serrato-dentatis, capitulis conferto-corymbosis circiter 40-floris.

Hab. In moist open places, near San Romão, Province of Minas Geraes, Brazil. Fl. July.

Herba 1-2-pedalis. Folia 10-18-lin. longa, 4-5 lata, supra viridia, subtus pallida. Petioli 2-lin. circiter longi. Involucrum campanulatum, squamis biseriatis, lineari-oblongis, obtusis, 3-nerviis, extus villosis, apice barbatis, 1½ lin. longis. Receptaculum conicum, paleaceum, paleis paucis, parvis, spathulatis, obtusis, glabris. Achænium oblongum, 5-angulatum, nigrum, epapposum.

This species is well distinguished from the other Brazilian ones by the very small scales of the receptacle.

4838. Is. *foliosa*; tota villoso-subtomentosa, caule herbaceo suberecto ramoso, ramis teretibus striatis foliosis, foliis sessilibus oblongo-lanceolatis utrinque obtusis supra medium serrato-dentatis triplinerviis, capitulis paucis ad apicem ramulorum corymbosis circiter 30-floris.

Hab. In inundated places on the banks of the Rio Urucuya, near San Romão, Province of Minas Geraes, Brazil. Fl. in June.

Herba 1-1½-pedalis. Folia 10-lin. longa, 3-lin. lata. Involucrum campanulatum, squamis biseriatis, oblongis, obtusis, 3-nerviis, extus dense villosis, 1½ lin. longis. Receptaculum conicum, paleaceum, paleis lineari-spathulatis, obtusis, 1-nerviis, extus ad apicem villoso-barbatis. Corollæ tubulosæ, ad faucem dilatatæ, glabræ, 1½ lin. longæ. Styli rami exserti, clavati. Achænium oblongum, 5-angulatum, glabrum, nigrum, eleganter reticulatum, epapposum.

Stevia, *Cavin.*

4839. (2). St. *(Paleaceo-aristatæ) resinosa*; caule herbaceo erecto ramoso pubescenti-tomentoso, foliis oppositis oblongis obtusis basi in petiolum attenuatis crenato-serratis utrinque pubescenti-tomentosis resinoso-punctatis triplinerviis nervis subtus prominulis, capitulis breviter pedicellatis ad apices ramulorum paucis, involucri squamis lineari-lanceolatis acutis extus piloso-tomentosis, pappo paleaceo et subbiaristato.

Hab. Serra de Piedade, Province of Minas Geraes, Brazil. Fl. in Sept.

Herba pedalis et ultra. Folia 12-15-lin. longa, 4-6-lin. lata. Pedicelli glandulosi. Involucrum cylindricum, squamis 5, 3-lin. circiter longis. Flores rosei, extus versus basin pilosi. Achænia superne ad angulos pilosa. Aristæ corolla triplo breviores.

So far as regards technical characters, this species appears to come near S. *ivæfolia*, Wild.

4839. (3). St. (*Multiaristatæ*) *collina;* caule herbaceo erecto parce ramoso villoso-tomentoso, foliis oppositis oblongo-lanceolatis acutis in petiolum attenuatis grosse serrato-dentatis 3-nerviis, nervis subtus prominulis, utrinque sparse pilosis subtus nigro-punctatis, corymbo paniculato, capitulis pedicellatis, involucri squamis lineari-lanceolatis acuminatis pilosis achænium angulato-sulcatum ad apicem pilosiusculum, superantibus pappi aristis 15-20 scaberrimis achænio longioribus.

HAB. Near Morro Velho, Province of Minas Geraes, Brazil. Fl. in Sept.

Herba 1½-2-pedalis. Folia 2-poll. circiter longa, 6-7-lin. lata, supra viridia, subtus pallida. Pedicelli dense glanduloso-pilosi. Involucrum cylindricum, squamis 5, 3½ lin. longis, 3-nerviis. Corollæ roseæ, lobis extus pilosis.

This species will range along with S. *Lundiana*, DC.

1744 et 2211. St. (*Multiaristatæ*) *imbricata;* caule herbaceo erecto ramoso tereti striato puberulo, foliis inferioribus oppositis lanceolatis acutis in petiolum attenuatis ad medium grosse serrato-dentatis membranaceis triplinerviis glabriusculis superioribus alternis, capitulis ad apices ramulorum paucis pedicellatis 6-floris, involucri squamis biseriatis imbricatis anguste lanceolatis acuminatis glabriusculis, exterioribus minoribus, achænio angulato-sulcato pilosiusculo, pappi aristis 35-40 inæqualibus scaberrimis achænio longioribus.

HAB. Near Aracaty, Province of Ceará (n. 1744), and dry sandy Campos, near the city of Oeiras, Province of Piauhy (n. 2211), Brazil. Fl. in June.

Annua, 2-pedalis. Folia 2-poll. longa, 6-9-lin. lata. Pedicelli pilosi. Involucrum subcylindricum, 4 lin. longum, squamis 3-nerviis, nervis extus prominulis. Corollæ roseæ, cylindricæ. Styli rami breviter exserti.

Near S. *calycina*, DC., with which it agrees in having a

double series of involucral scales, but differs in having lanceolate serrate, not linear entire, leaves, and pilose achænia.

TRICHOGONIA, *Gardn.*

KUHNIA, Sect. TRICHOGONIA, *DC. Prodr.* 5, *p.* 126. *Endl. Gen. Plant. p.* 368.

CHAR. GEN. *Capitulum* multiflorum, involucri squamis 1-2-serialibus, æqualibus. *Receptaculum* nudum, planum. *Corollæ* tubulosæ, ad faucem ampliatæ, extus pilosæ. *Styli* rami longe exserti, semiterites, clavati, obtusi. *Achænia* acute pentagona, ad angulos piloso-scabrida. *Pappus* 1-serialis, plumosus.—Herbæ *vel* suffrutices, *in Brasilia et America Boreali crescentes,* foliis *alternis vel rariter oppositis, uninerviis, rarius triplinerviis, linearibus vel ovatis,* capitulis *corymbosis, pedicellatis,* corollis *pallide purpureis.*

I have here separated and formed into a distinct genus De Candolle's second section of the genus *Kuhnia,* because the three species which constitute that section, together with three new ones which I find in my Brazilian collections, differ from the normal species of the genus in having the involucral scales of the same length, the corolla with a widely dilated throat, and hairy outside, and the achænia acutely five-angled, with the angles pilose. From *Clavigera,* which it approaches in some respects, *Trichogonia* differs in the nature of the involucrum and achænia.

2212. Trich. *campestris* ; herbacea basi sublignosa ramosa, ramis elongatis striatis pubescentibus ad apicem subcorymboso-ramulosis, foliis inferioribus late linearibus obtusis in petiolum attenuatis grosse et distanter dentatis, superioribus angustioribus integerrimis, capitulis paucis pedicellatis corymbosis sub-20-floris, involucris quamis 1-serialibus æqualibus lineari-oblongis obtusis extus puberulis ad apicem barbatis 5-nerviis.

HAB. In open sandy Campos, near the city of Oeiras, Province of Piauhy, Brazil. Fl. in March and April.

Herba erecta, $1\frac{1}{2}$ pedalis. Folia majora 2-poll. longa,

2-lin. circiter lata, pennivenia, reticulata. Involucrum campanulatum, squamis 2 lin. longis. Receptaculum nudum. Corollæ 1½ lin. longæ, ad faucem dilatatæ, obtuse 5-dentatæ, dentibus extus hirtis, pallide purpureæ. Styli rami valde elongati, semiteretes, clavati, obtusi. Achænium oblongum, basi attenuatum, acute pentagonum, præcipue ad angulos piloso-scabrum. Pappus corolla brevior uniserialis, æqualis, paleis setosis, plumosis, stramineis.

4851. Trich. *multiflora*; fruticulosa erecta ramosa tota piloso-glandulosa, ramis striatis foliosis, foliis sessilibus linearibus utrinque obtusis margine revolutis supra medium serrato-dentatis, capitulis pedicellatis corymbosis circiter 70-floris, involucri squamis 2-serialibus æqualibus lineari-lanceolatis acuminatis extus glanduloso-pilosis 3-nerviis.

Hab. In elevated Campos in the Diamond District, Brazil. Fl. in July.

Frutex 3-4-pedalis. Folia secus ramos conferta, pennivenia, reticulata, 12-16-lin. longa, 2½ lin. circiter lata. Involucrum campanulatum, squamis 4 lin. longis, interioribus angustioribus. Receptaculum nudum. Corollæ ad faucem ampliatæ, extus hirsutæ, 2½ lin. longæ, pallide purpureæ. Styli rami elongati, compressi, ad apicem dilatati, obtusi. Achænium elongatum, basi attenuatum, 5-angulatum, ad angulos præcipue piloso-scabrum. Pappus corolla brevior æqualis, uniserialis, paleis setosis plumosis, stramineis.

4839. (1) Trich. *salviæfolia*; glanduloso-pubescens, caule erecto basi suffruticoso striato ad apicem corymboso-ramoso, foliis longe petiolatis inferioribus oppositis lineari-lanceolatis acutiusculis basi obtusis grosse serrato-dentatis superioribus alternis, capitulis breviter pedicellatis corymbosis 30-floris, involucri squamis 2-serialibus æqualibus lineari-oblongis obtusis extus glanduloso-pubescentibus ad apicem barbatis 3-nerviis.

Hab. In a dry Campo, near Morro Velho, Province of Minas Geraes, Brazil. Fl. in Sept.

Herba 1-1½-pedalis, basi lignosa, caule tereti, folioso. Folia 2-poll. longa, 4-lin. lata, pennivenia, minute pellucido-

punctata; petioli 6-lin. longi, teretes. Involucrum campanulatum, squamis 1½ lin. longis. Receptaculum nudum. Corollæ ad faucem dilatatæ, extus hirsutæ, 1½ lin. longæ. Styli rami elongati, semiterites, clavati. Achænium oblongum, basi attenuatum, pentagonum, ad angulos pilosum. Pappus corolla brevior æqualis, uniserialis, paleis setosis, plumosis, albidis.

Clavigera, DC.

2898, 4846, et 4847. Cl. *pinifolia;* fruticosa glabra ramosa, ramis elongatis subfasciculatis teretibus subangulatis dense foliosis, foliis alternis sessilibus solitariis vel ternatim-fasciculatis anguste linearibus acutis integerrimis uninerviis utrinque punctulatis, capitulis corymboso-fasciculatis pedicellatis erectis 4-floris, involucri squamis laxe imbricatis 3-seriatis oblongis obtusis vel acutiusculis striatis glabris ciliolatis, exterioribus multo brevioribus ovatis, achænio 10-angulato piloso-villoso.

Hab. Dry bushy hills, district of the Rio Preto, Province of Pernambuco (n. 2898), elevated Campos in the Diamond District (n. 4847), and on the Serra de Piedade, Minas Geraes (n. 4846), Brazil. Fl. from July to Sept.

Frutex 4-6 pedalis. Folia 12-15-lin. longa, ½ lin. lata. Involucrum subcylindricum, 3-3½ lin. longum. Receptaculum planum nudum. Corollæ tubulosæ, glabræ, 5-dentatæ. Stylus basi bulbosus, bulbis villosis. Pappus 1-serialis, inæqualis, setosus, scaber.

A curious point connected with this plant is the manner in which the leaves are arranged, being alternate, and either solitary or in fascicles of threes, the bases of the two lateral ones being covered by that of the middle one.

Liatris, *Schreb.*

4864. L. (*Leptoclinium*) *Brasiliensis;* fruticosa glabra dichotomo-ramosa, ramis angulato-striatis foliosis, foliis oppositis et summis alternis brevissime petiolatis internodio lon-

gioribus anguste oblongo-lanceolatis acutis basi cuneatis supra medium serrato-dentatis glaberrimis reticulato-venosis venis utrinque prominulis, junioribus viscosis, corymbo terminali oligocephalo, capitulis breviter pedicellatis 5-floris, involucri oblongi squamis 3-seriatis ovato-oblongis striatis ciliolatis extus glabris viscosis, exterioribus brevioribus, achænio 5-angulato piloso-scabrido.

HAB. Elevated rocky places in the Diamond District, Brazil. Fl. in August.

Frutex 3-pedalis. Folia 12-14-lin. longa, 3-4½-lin. lata, coriacea. Involucrum 3 lin. longum, albidum. Receptaculum obtuse conicum, punctatum, nudum. Corollæ tubulosæ, glabræ, purpureæ, 5-dentatæ, dentibus oblongis, obtusis. Antheræ inclusæ. Styli rami cylindrici, longe exserti. Pappus 2-serialis, corolla brevior, rufo-purpurescens, setis barbellatis, exterioribus brevioribus.

This small shrub, which forms a most interesting addition to the Flora of Brazil, is very different in habit from the usual forms of *Liatris*. It, however, agrees with the L. *fruticosa*, Nutt., a native of East Florida. In general appearance it resembles very much some of the cuneate leaved species of *Baccharis*.

DECACHÆTA, *DC.*

4863. D. *longifolia* ; fruticosa ramosa, ramis teretibus striatis glabris, foliis oppositis petiolatis longe lanceolatis basi acutis apice acuminatissimis glaberrimis grosse serrato-dentatis penniveniis venis utrinque prominulis, superioribus alternis longioribus viscosis, corymbis axillaribus terminalibusque dichotomo-ramosis laxis fulvo-villoso-tomentosis, capitulis breviter pedicellatis oblongis 8-12-floris, involucri squamis 3-seriatis oblongis obtusis striatis extus resinoso-viscosis, pappo coroniformi 5-dentato.

HAB. In elevated rocky tracts in the Diamond District, Brazil. Fl. in July.

Frutex 5-6 pedalis. Folia 5-7-poll. longa, 6-10-lin. lata,

eleganter reticulato-venosa. Involucrum 2-lin. longum. Receptaculum convexum, paleaceum, paleis linearibus, obtusis, ad apicem pilosiusculis. Corollæ tubulosæ, glabræ. Antheræ inclusæ, breviter et obtuse appendiculatæ. Styli rami longi exserti. Achænia acute 5-angulata, glabra.

Although this and the succeeding species differ in some minor points from the one on which De Candolle founded the genus, they are not of sufficient importance to constitute a generic distinction. In the present species the pappus is reduced to a mere ring, but the presence of fine teeth show a tendency to the production of setæ. In the following species the setæ vary from 5 to 10, those corresponding to the angles of the achænium being the largest, while the intermediate ones are either wanting altogether, or much smaller than the others.

1736 et 1974. D. *conferta;* fruticosa ramosa, ramis teretibus striatis glabris, foliis oppositis petiolatis lanceolatis basi acutis apice acuminatis glaberrimis minute subserrato-dentatis penniveniis venis utrinque prominulis, junioribus viscosis, corymbis terminalibus confertis irregulariter ramosis fusco-tomentosis, capitulis breviter pedicellatis oblongis 6-14-floris, involucri squamis 2-seriatis obtusis subapiculatis striatis ciliatis extus resinoso-viscosis, pappo 5-10-setoso, setis glabris valde inæqualibus.

Hab. Serra de Araripe (n. 1736), and Maçapé (n. 1974), Province of Ceará, Brazil. Fl. Oct. and Dec.

Frutex 5-pedalis. Folia 3½-5-poll. longa, 9-lin. lata, eleganter reticulato-venosa. Involucrum vix 2-lin. longum. Receptaculum planum, paleaceum, paleis lineari-subspathulatis, obtusis, ad apicem pilosiusculis. Corollæ tubulosæ, glabræ. Antheræ inclusæ, breviter et obtuse appendiculatæ. Styli rami longe exserti. Achænia acute 5-angulata, glabra.

Chromolæna, *DC.*

4840. (1). Ch. *horminoides*, DC.; herbacea parce ramosa ubique capitulis exceptis tomentosa, foliis petiolatis lanceolatis utrinque acutis apice mucronulatis crenato-serratis subtriplinerviis creberrime resinoso-punctatis, capitulis ad apices ramulorum paucis subcymosis 40-floris, involucri obovati squamis multiserialibus imbricatis late oblongis obtusis striatis glaberrimis.

Chromolæna *horminoides, DC. Prodr.* 5, *p.* 133.

Hab. Diamond District, Brazil. Fl. in July.

Herba perennis, basi simplex, 1-2-pedalis. Folia 3-4-poll. longa, 9-12-lin. lata, subtus lanuginoso-tomentosa. Involucrum pallide violaceum, 6 lin. longum. Receptaculum paleaceum, paleis linearibus, obtusis, apice coloratis. Corollæ violaceæ, vix exsertæ. Achænia acute 5-angulata, ad angulos piloso-scabrida. Pappus 1-serialis, setosus, setis scabridis, stramineis, corollam subæquantibus.

This I believe to be the plant on which De Candolle founded the genus. It and the two succeeding species are remarkable for the immense number of very minute globular resinous particles which exist on both sides of the leaves. They are much fewer on my C. *pratensis* (Hook. Lond. Journ. 1, p. 176), and do not exist at all on C. *decumbens*.

4840. Ch. *Candolleana;* herbacea erecta ramosa tota capitulis exceptis tomentosa, ramis oppositis elongatis teretibus striatis foliosis, foliis brevi petiolatis utrinque obtusiusculis apice mucronulatis grosse crenato-serratis triplinerviis creberrime resinoso-punctatis, capitulis ad apices ramulorum paucis subcorymbosis 40-floris, involucri obovato-oblongi squamis multiserialibus imbricatis oblongis obtusis striatis glaberrimis.

Hab. Serra das Araras, Province of Minas Geraes, Brazil. Fl. in June.

Herba perennis, 2-3-pedalis. Folia 15-24-lin. longa, 6-9-lin. lata. Petioli 1½-2-lin. longi. Involucrum pallide violaceum, 6-lin. longum. Receptaculum paleaceum, paleis anguste

linearibus obtusis, 5 lin. longis. Corollæ violaceæ involucro subæquales. Achænia acute 5-angustata, ad angulos piloso-scabrida. Pappus uniserialis, setosus, setis scabridis, stramineis, corollam subæquantibus.

Distinguished from the preceding species by its smaller and differently shaped leaves, narrower involucral scales, and more branched habit.

4841. Ch. *leucocephala*; herbacea erecta ramosa tota capitulis exceptis villoso-tomentosa, ramis oppositis confertis teretibus striatis foliosis, foliis brevissime petiolatis oblongis vel ovato-oblongis utrinque obtusis crenatis triplinerviis creberrime resinoso-punctatis, capitulis ad apices ramulorum 1-3 in paniculam magnam dispositis 25-floris, involucri oblongi squamis multiserialibus imbricatis spathulato-oblongis obtusis striatis glaberrimis.

Hab. Dry Campos between the Rio Claro and San Romão, Province of Minas Geraes, Brazil. Fl. in June.

Herba perennis, bipedalis. Folia 15-24-lin. longa, 8-12-lin. lata, basi interdum subcordata, grosse reticulata. Involucrum stramineum, 7-lin. longum. Receptaculum paleaceum, paleis stellato-radiatis stipitatis. Corollæ violaceæ involucro breviores. Achænia acute 5-angulata, ad angulos piloso-hispida. Pappus uniserialis, setis scabridis, stramineis.

This species is distinguished from the preceding by its very remote habit, differently shaped leaves, longer and narrower capitula, straw-coloured, not violaceous, involucral scales, and from all the species of the genus by the very remarkable scales of the receptacle.

4860. Ch. *alternifolia;* caule herbaceo erecto tereti striato villoso-tomentoso simplici, foliis alternis petiolatis oblongo-ellipticis obtusis basi acutis crenato-dentatis coriaceis supra pilosiusculis subtus piloso-tomentosis triplinerviis, corymbis terminalibus, capitulis ad apices ramulorum confertis sessilibus 12-floris, involucri oblongi squamis 3-seriatis laxe imbricatis oblongis acutis striatis subciliatis, exterioribus brevioribus ad apicem pilosis.

Hab. Dry hills near Morro Velho, Province of Minas Geraes, Brazil. Fl. in Sept.

Herba perennis. Caules plures ex eadem radice, 1½-2-pedales, erecti, foliosi. Folia 15-18-lin. longa, 8-lin. lata, reticulato-venosa. Involucrum vix 3-lin. longum. Receptaculum paleaceum, paleis lineari-lanceolatis, acuminatis, 2½ lin. longis. Corollæ violaceæ. Achænia acute 5-angulata, ubique pilosiuscula. Pappus uniserialis, setis scabridis, stramineis, corollam subæquantibus.

This species differs from all the others in its alternate leaves, compact corymb, and clustered few-flowered capitula.

4754. (3). Ch. *decumbens*; caule herbaceo simplici tereti basi sublignoso decumbente hirsuto folioso; cæteris subaphyllis glabriusculis, foliis breviter petiolatis obovatis basi cuneatis apice obtusis integerrimis glabriusculis triplinerviis, superioribus paucis subbracteiformibus, capitulis terminalibus solitariis 45-floris, involucri campanulati squamis multiserialibus imbricatis oblongis obtusis striatis glabris.

Hab. Dry hills near Morro Velho, Province of Minas Geraes, Brazil. Fl. in Sept.

Herba perennis. Caules plures ex eadem radice semipedales pedalesve, basi foliosæ. Folia 6-9-lin. longa, 3-5-lin. lata. Involucrum violaceum, 4½ lin. longum. Corollæ violaceæ. Achænia 5-angulata, ad angulos piloso-hispida. Pappus uniserialis, setis scabridis, ad apicem violaceis, cæteris stramineis.

This is well distinguished from all the other species by its small size, simple stems, and solitary capitulæ.

Conoclinium, *DC.*

5512. C. *affine*; basi suffruticosum, ramis teretibus striatis cano-villosis, foliis oppositis et summis alternis longe petiolatis triangulari-ovatis acutis basi truncatis cordatisve crenatis utrinque piloso-pubescentibus membranaceis tri-

nerviis, corymbis axillaribus terminalibusque oligocephalis, capitulis breviter pedicellatis circiter 35-floris, involucri campanulati squamis biseriatis linearibus acuminatis dorso piloso-pubescentibus, achænio piloso-scabriusculo.

HAB. Bushy places, near Tijuca, Province of Rio de Janeiro, Brazil. Fl. in Dec.

Herba perennis, basi sublignosa. Folia 2½-3-poll. longa, 15-18-lin. lata. Involucrum 2-lin. longum. Receptaculum conicum. Pappus albidus.

Near C. *betonicæforme*, DC., from which it differs in its triangular-ovate leaves, which are besides much less cordate at the base, and more coarsely crenated. The capitula are also fewer flowered.

CAMPULOCLINIUM, *DC.*

1048. (1). C. *arenarium*; caule herbaceo tereti sparse villoso apice oligophyllo, foliis oppositis longe petiolatis ovatis obtusis basi truncatis cordatisve grosse crenato-dentatis ciliatis supra glabriusculis subtus sparse hirsutis, petiolis dense villosis, capitulis corymbosis 3-4 longe pedunculatis erectis 130-floris campanulatis, involucri squamis 3-seriatis subæqualibus lineari-lanceolatis acutis striatis integris extus versus apicem subpilosis, achænio piloso-scabrido.

HAB. In shady sandy places, near Pernambuco, Brazil. Fl. in June.

Annuum, 1-2-pedale, vix ramosum. Folia membranacea subtriplinervia. Petioli 18-22-lin. longi. Lamina 2-poll. longa, 18-lin. lata. Involucrum late campanulatum, 3-lin. longum. Receptaculum convexum, hemisphæricum, nudum. Corollæ purpuracentes, glabræ. Achænium angulatum, ad angulos pilosum. Pappus 1-serialis, setosus, setis corolla brevioribus, anguste linearibus, piloso-scabridis, stramineis.

BOLBOSTYLIS, *DC.*

2899 et 4843. B. *elegans*; caule herbaceo erecto pubescente

vel glabriusculo ramoso, foliis oppositis sessilibus anguste lanceolato-linearibus utrinque subattenuatis acutiusculis integerrimis glaberrimis vel pubescentibus coriaceis nitidis reticulatis, panicula subcorymbosa puberula, capitulis pedicellatis erectis 30-35-floris, involucri obovati squamis laxe imbricatis lineari-lanceolatis acuminatis striatis extus villosis, exterioribus brevioribus, achænio acute 5-costato piloso-scabrido.

HAB. Serra da Batalha, district of the Rio Preto, Province of Pernambuco (n. 2899), and in dry Campos near the Rio Claro, Province of Minas Geraes (n. 4843), Brazil. Fl. in June.

Herba perennis, bipedalis. Folia 3-4-poll. longa, 3-4-lin. lata. Involucrum 3½ lin. longum, squamis 4-serialibus, coloratis. Receptaculum planum, nudum. Corollæ tubulosæ, ad faucem dilatatæ, glabræ, violaceæ. Stylus basi bulbosis, bulbis glabris. Pappus uniserialis, æqualis, setosus, scaber, albidus.

4844. B. *tomentosa*; caule herbaceo erecto villoso-tomentoso tereti ad apicem paniculato-ramoso, foliis oppositis sessilibus obtusis basi longe cuneatis integerrimis coriaceis utrinque dense villoso-tomentosis penniveniis, capitulis ad apices ramulorum corymbosis in paniculam dispositis pedicellatis, erectis 35-floris, involucri obovati squamis linearibus acuminatis striatis extus piloso-pubescentibus, exterioribus multo brevioribus, achænio 5-costato scabrido.

HAB. Elevated Campos in the Diamond District, Brazil. Fl. in July.

Herba perennis, bipedalis. Folia 2-3-poll. longa, 7-8-lin. lata, coriacea. Involucrum 3-lin. longum, squamis 3-seriatis. Receptaculum planum, nudum. Corollæ tubulosæ, glabræ, roseæ. Stylus basi bulbosis, bulbis glabris. Pappus uniserialis, æqualis, setosus, scaber, albidus.

1734. B. *microcephala*; caule herbaceo erecto tereti pubescente ramoso, foliis oppositis sessilibus oblongis obtusis basi cuneatis distanter dentatis utrinque pubescentibus subcoriaceis penniveniis, panicula subcorymbosa, capitulis

pedicellatis erectis 15-floris, involucri obovati squamis laxe imbricatis oblongo-linearibus obtusis apiculatis striatis villosiusculis, exterioribus multo minoribus, achænio acute 5-angulato piloso.

HAB. Serra de Araripe, Province of Ceará, Brazil. Fl. from Oct. to Dec.

Herba perennis, 1-2-pedalis. Folia 15-20-lin. longa, 5-8-lin. lata, reticulata. Involucrum 2½ lin. longum, squamis 3-seriatis. Receptaculum planum nudum. Corollæ tubulosæ, glabræ, violaceæ. Stylus basi bulbosus, bulbis glabris. Pappus uniserialis, æqualis, setosus, scaber, albidus.

This is somewhat allied to the preceding species, but well distinguished by its much shorter dentate leaves, and smaller and fewer flowered capitula. By the same characters it is also distinguished from the following species.

——. B. *glandulosa*; caule herbaceo erecto piloso-tomentoso tereti basi simplici, foliis oppositis sessilibus oblongo-lanceolatis obtusis basi subcuneatis integris vel subdentatis coriaceis utrinque dense piloso-scabridis penniveniis, panicula laxa subcorymbosa tomentosa, capitulis pedicellatis erectis 45-50 floris, involucri squamis laxe imbricatis subsquarrosis linearibus acuminatis striatis extus glanduloso-piloso-pubescentibus, exterioribus brevioribus, achænio 5-angulato piloso-scabrido.

HAB. Province of Minas Geraes, Brazil.

Herba perennis, 2-3-pedalis. Folia 2½-3 poll. longa, 9-14-lin. lata, subtus reticulata. Involucrum 5 lin. longum, squamis 3-seriatis. Receptaculum planum, nudum. Corollæ tubulosæ, glabræ, basi valde dilatatæ, violaceæ. Stylus basi bulbosus, bulbis glabris. Pappus 1-serialis, æqualis, setosus, scaber, albidus.

I have unfortunately lost the number and exact locality of this plant, but as it exists among my Minas Geraes Collections, there can be no doubt that it is from that province.

4848. B. *oblongifolia*; caule herbaceo erecto tereti tomentoso basi simplici, foliis oppositis petiolatis oblongis obtusis

basi subcuneatis serrato-dentatis coriaceis supra minute piloso-scabridis subtus velutino-tomentosis subtriplinerviis, panicula laxa subcorymbosa tomentosa, capitulis pedicellatis erectis circiter 100-floris, involucri squamis laxe imbricatis linearibus acuminatis striatis extus piloso-pubescentibus, exterioribus multo-brevioribus, achænio 3-angulato scabrido.

HAB. Dry Campos near Formigas, in the Sertão of the Province of Minas Geraes, Brazil. Fl. in July.

Herba perennis, 1½-2-pedalis. Folia 3-3½-poll. longa, 9-18-lin. lata. Petioli 6-7½-lin. longi. Involucrum 4½-lin. longum, squamis 4-seriatis. Receptaculum planum, nudum. Corollæ tubulosæ, glabræ, pallide purpureæ. Stylus basi bulbosus, bulbis glabris. Pappus 1-serialis, æqualis, setosus, scaber, stramineus.

4842. B. *scandens*; caule suffruticoso subscandente villosiusculo tereti minute striato, foliis oppositis petiolatis ovato-lanceolatis acuminatis basi rotundatis distanter serrato-dentatis glabris triplinerviis reticulatis membranaceis, panicula laxa tomentosa, ramis divaricatis, capitulis paucis pedicellatis 60-floris, involucri squamis laxe imbricatis, interioribus lineari-lanceolatis acutis striatis glabris, exterioribus minoribus ovatis extus pubescentibus ciliatis, achænio 5-angulato scabriusculo.

HAB. In woods near Cocaës, Province of Minas Geraes, Brazil. Fl. in August.

Suffrutex, scandens. Folia 3½-4-poll. longa, 12-18-lin. lata. Petioli 6-lin. longi, marginati. Involucrum 5-lin. longum, squamis 3-seriatis, scariosis. Receptaculum planum, nudum. Corollæ tubulosæ, glabræ, pallide purpureæ. Stylus basi bulbosus, bulbis glabris. Pappus uniserialis, æqualis, setosus, scaber, albidus.

4842. (1). B. *pumila*; caule herbaceo erecto tereti striato basi hirsuto folioso, foliis oppositis sessilibus oblongo-lanceolatis vel lanceolatis obtusis basi cuneato-attenuatis supra medium grosse serrato-dentatis utrinque hirsutiusculis ciliatis membranaceis subtriplinerviis, panicula oligo-

cephala pubescenti-tomentosa, capitulis pedicellatis erectis circiter 45-floris, involucri squamis laxe imbricatis linearibus acuminatis striatis extus piloso-pubescentibus, achænio 5-angulato piloso-scabrido.

Hab. Serra de Curral D' El Rey, Province of Minas Geraes, Brazil. Fl. in Sept.

Herba perennis, subbipedalis. Folia 2½-poll. longa, 6-9-lin. lata, reticulata. Involucrum 6 lin. longum, squamis 3-seriatis, exterioribus brevioribus. Receptaculum subconvexum, nudum. Corollæ tubulosæ, glabræ, pallide purpureæ. Stylus basi bulbosus, bulbis glabris. Pappus uniserialis, æqualis, setosus, scaber, sordidus.

A small and very distinct species. The two upper thirds of the stem have only one small pair of leaves about the middle.

4849 et 4853. B. *Cassiniana*; caule herbaceo erecto tereti glanduloso-pubescenti-tomentoso basi simplici, foliis oppositis petiolatis ovato-lanceolatis acutis vel acutiusculis basi rotundatis in petiolum decurrentibus minute glanduloso-serrato-dentatis utrinque pubescentibus membranaceis subtriplinerviis, panicula laxa subcorymbosa, capitulis longe pedicellatis erectis circiter 25-floris, involucri squamis laxe imbricatis lineari-lanceolatis acutis striatis pubescentibus, exterioribus multo minoribus ovatis acuminatis, achænio 5-angulato glanduloso-piloso scabrido.

Hab. Serra da Mendanha, Diamond District, Brazil. Fl. in July.

Herba perennis, 3-pedalis. Folia 3½-6-poll. longa, 12-24-lin. lata. Petioli cuneato-alati, 6-8-lin. longi. Involucrum 6-lin. longum, squamis 3-4-seriatis. Receptaculum planum, nudum. Corollæ tubulosæ, glabræ. Stylus basi bulbosus, bulbis pilosis. Pappus uniserialis, æqualis, setosus, scaber, albidus.

4845. B. *ramosissima*; suffruticosa ramosissima tota pubescens, ramis teretibus, foliis oppositis longe petiolatis late ovatis vel ovato-lanceolatis acuminatis basi in petiolum cuneato-attenuatis grosse serrato-dentatis tripli- vel quin-

tupli-nerviis membranaceis, capitulis ad apices ramulorum paucis pedicellatis subcorymbosis in paniculam foliosam dispositis 40-floris, involucri squamis laxe imbricatis lineari-lanceolatis acutis striatis puberulis lacerato-ciliatis scariosis, exterioribus minoribus ovato-lanceolatis acuminatis, achænio acute 5-angulato piloso-scabrido.

HAB. Woods near Cidade do Serro, Province of Minas Geraes, Brazil. Fl. in August.

Suffrutex, diffuse ramosus. Folia 4-8-poll. longa, 1½-2½ poll. lata. Petioli 1-2-poll. longi, cuneato-alati. Involucrum 5-lin. longum, squamis 3-seriatis. Receptaculum convexum, nudum. Corollæ tubulosæ, glabræ. Stylus basi bulbosus, bulbis pilosiusculis. Pappus uniserialis, æqualis, setosus, scaber, albidus.

This and the two preceding species agree with *Bolbostylis glabra*, DC., in habit, but are otherwise very distinct.

EUPATORIUM, *Tourn.*

2900. Eu. (*Subimbricata*) *bracteatum*; fruticosum ramosum velutino-tomentosum, ramis teretibus striatis foliis oppositis ovatis vel ovato-oblongis obtusis basi in petiolum cuneato-attenuatis coriaceis grosse serrato-dentatis penniveniis reticulatis, corymbis terminalibus trichotomo-paniculatis, pedicellis ad apicem bracteatis, capitulis 5-6-floris, involucri squamis 2-3-seriatis laxe imbricatis oblongo-lanceolatis acuminatis striatis extus tomentosis, exterioribus brevioribus, achænio ubique piloso.

HAB. District of the Rio Preto, Province of Pernambuco, Brazil. Fl. in Sept.

Frutex 6-pedalis. Folia 2-2½-poll. longa, 8-15-lin. lata. Involucrum 4-lin. longum. Pappus stramineus.

This species comes near E. *dictyophyllum*, DC., but that plant has alternate leaves, and narrower involucral scales.

2645. Eu. (*Subimbricata*) *Piauhyense*; fruticosum glabrum, ramis teretibus striatis, foliis oppositis petiolatis lanceolatis utrinque acutis serratis triplinerviis eleganter reticu-

latis, paniculis axillaribus terminalibusque polycephalis, capitulis breviter pedicellatis 6-floris, involucri squamis 4-seriatis laxe imbricatis oblongis obtusis 3-nerviis ciliatis, exterioribus multo brevioribus ovatis acutis, achænio ad angulos scabriusculo.

HAB. Near Paranagoa, Province of Piauhy, Brazil. Fl. in Sept.

Frutex ramosus, 6-pedalis. Folia 3-3½-poll. longa, 6-10½-lin. lata, reticulato-venosa, venis utrinque prominulis. Capitula 3-lin. longa. Pappus albidus.

Allied to E. *pyrifolium*, DC., but well distinguished by its lanceolate triplinerved leaves.

4865. Eu. (*Subimbricata*) *velutinum*; arboreum, ramis teretibus fulvo-tomentosis, foliis oppositis petiolatis oblongo-lanceolatis acuminatis basi acutis integerrimis supra pubescentibus subtus velutino-tomentosis penniveniis, corymbo amplo conferto polycephalo subdichotome ramoso, capitulis sessilibus oblongis 5-floris, involucri squamis 3-seriatis laxe imbricatis oblongo-linearibus obtusis 3-nerviis ciliatis, exterioribus brevioribus piloso-tomentosis.

HAB. Woods near Cidade do Serro, Province of Minas Geraes, Brazil. Fl. in August.

Arbuscula circiter 12-pedalis. Folia 6-poll. longa, 16-lin. lata. Involucrum 4½ lin. longum. Pappus sordidus.

This is very distinct from any described species.

4852. (1). Eu. (*Subimbricata*) *compressum*; suffruticosum viscosum glaberrimum, caule tereti striato, foliis oppositis vel interdum superioribus alternis longe petiolatis lanceolatis utrinque acuminatis nitidis serratis triplinerviis, nervis utrinque prominulis, corymbo fastigiato composito, ramis compressis angulato-striatis, pedicellis brevibus striatis glabris, capitulis oblongis 5-floris, involucri squamis imbricatis oblongis obtusis striatis.

HAB. Near Marianna, Province of Minas Geraes, Brazil. Fl. in Oct.

Suffrutex, ramosus, 2-3-pedalis. Folia 4-5-poll. longa, 9-11-lin. lata, membranacea, subviscoso-nitida. Capitula

4 lin. longa. Achænia resinoso-punctata. Pappus stramineus.

Apparently near E. *pallescens*, DC.

4861 et 4862. Eu. (*Subimbricata*) *pungens*; fruticosum, ramis teretibus striatis villosis, foliis oppositis petiolatis rhomboideo-ovatis utrinque obtusis vel acutiusculis crenato-serratis supra pilosis subtus tomentosis triplinerviis, corymbis confertis subpaniculatis, pedunculis tricephalis, capitulis breve pedicellatis cylindricis 25-30-floris, involucri squamis imbricatis lineari-lanceolatis acuminatis striatis glabris margine ciliolatis, exterioribus ovatis, achæniis ad angulos subscabridis.

HAB. Serra das Araras (n. 4861), and between the Rio Claro and San Romão (n. 4862), Province of Minas Geraes, Brazil. Fl. in June.

Frutex ramosus, 3-5-pedalis. Folia 2-2½-poll. longa, 1-1½-poll. lata. Capitula 4½-lin. longa. Pappus rufescens.

Number 4861, which is from a greater elevation than the other, has narrower, more acute, and less tomentose leaves. As a species this will range along with E. *discolor*, DC.

6855. Eu. (*Eximbricata*) *rupestre*; herbaceum, caule erecto ramoso glanduloso-pubescenti-viscoso, ramis teretibus striatis, foliis oppositis et summis alternis petiolatis ovatis vel ovato-lanceolatis apice obtuse attenuatis basi acutis a medio ad apicem serrato-dentatis utrinque pilosiusculis membranaceis trinerviis, corymbis ad apices ramulorum subtricephalis, capitulis longe pedicellatis 70-75-floris, involucri campanulati squamis biseriatis subæqualibus linearibus acuminatis striatis pilosiusculis, achænio ad apicem piloso-scabrido.

HAB. Stony places between the Rio Claro and San Romão, Province of Minas Geraes, Brazil. Fl. in June.

Herba perennis 2-pedalis. Folia 18-20-lin. longa, 6-12 lin. lata. Involucrum 2½ lin. longum. Pappus albidus.

Closely allied to E. *innumerosum*, DC.

4850. Eu. (*Eximbricatum*) *crenulatum*; fruticosum, ramis teretibus angulato-striatis pubescenti-velutinis, foliis alter-

nis petiolatis ovatis basi cordatis apice obtusis crenulatis utrinque pubescenti-velutinis triplinerviis reticulato-venosis, corymbo terminali 5-6-cephalo conferto, capitulis longe pedicellatis circiter 50-floris, involucri squamis biseriatis æqualibus oblongo-linearibus obtusis striatis extus pubescenti-tomentosis, interioribus angustioribus, achænio piloso-scabrido.

Hab. Elevated rocky places in the Diamond District, Brazil. Fl. in July.

Frutex 4-pedalis, ramis foliosis. Folia 6-8-lin. longa, 4-5-lin. lata, subimbricata. Petioli 1½-lin. longi. Capitula campanulata, 3-lin. longa. Pappus sordide albidus.

Near E. *myrtilloides*, DC.

2419. Eu. (*Eximbricata*) *conoclinioides*; caule herbaceo erecto tereti angulato-striato puberulo, foliis oppositis et summis alternis internodio multo brevioribus longe petiolatis ovato-oblongis obtusis basi obtusis truncatisve vel subcordatis crenato-dentatis supra minute puberulis subtus velutino-puberulis membranaceis triplinerviis, corymbis axillaribus terminalibusque oligocephalis, capitulis pedicellatis 25-floris, involucri squamis biseriatis linearibus acuminatis striatis extus piloso-pubescentibus ad apicem villoso-barbatis, achænio acute 5-angulato stipitato ubique pilosiusculo.

Hab. Sandy Campos at Cachoeira, Province of Ceará, Brazil. Fl. in Feb.

Herba perennis ?, 2-3-pedalis. Folia 2-2½-poll. longa, 8-10-lin. lata. Involucrum 2½ lin. longum. Receptaculum planum. Pappus stramineus.

This species will range near E. *remotifolium*, DC.

877. Eu. (*Eximbricata*) *nudum*; herbaceum, caulibus e rhizomate lignoso plurimis erectis subsimplicibus teretibus striatis glabris apice aphyllis, foliis oppositis longe petiolatis ovatis cordatis obtusis serrato-dentatis glabriusculis membranaceis trinerviis reticulatis, petiolis villosiusculis, capitulis paucis corymbosis longe pedicellatis circiter

50-floris, involucri campanulati squamis biseriatis æqualibus lineari-lanceolatis acuminatis striatis glabris, achænio piloso scabrido.

HAB. Dry bushy places near Bahia, Brazil. Fl. in Oct.

Herba perennis, pedalis et ultra. Folia cum petiolo septemlineari 15-20-lin. longa, 6-9-lin. lata. Involucrum 1½ lin. longum. Pappus rufescens, setis subpaleaceis, barbellatis, corolla brevioribus.

Apparently near E. *oligocephalum*, DC.

4856. Eu. (*Eximbricata*) *laxum*; caule herbaceo erecto tereti striato pubescente, foliis oppositis petiolatis ovato-lanceolatis acutis basi obtusis vel breviter cuneatis serratis utrinque pubescentibus membranaceis trinerviis, corymbis laxe dichotomo-paniculatis, capitulis longe pedicellatis circiter 20-25-floris, involucri squamis biseriatis basi calyculatis oblongo-linearibus obtusis striatis ciliolatis glabriusculis, achænio pilosiusculo.

HAB. In bushy places on the banks of the Rio Claro, Province of Minas Geraes, Brazil. Fl. in June.

Herba perennis, 2-3-pedalis. Folia 2-poll. longa, 9 lin. lata. Involucrum 2½ lin. longum. Pappus albidus.

Near E. *paniculatum*, Schrad., but well distinguished by its very lax inflorescence.

773. Eu. (*Eximbricata*) *apiculatum*; herbaceum glabrum, caule erecto tereti striato ramoso, foliis oppositis longe petiolatis late ovatis acuminatis basi truncatis vel cordatis grosse serrato-dentatis, dentibus glanduloso-apiculatis glaberrimis subviscosis triplinerviis membranaceis eleganter reticulatis minute pellucido-punctatis, corymbis axillaribus terminalibusque fastigiatis pubescentibus, capitulis pedicellatis circiter 20-floris, involucri campanulati squamis biseriatis æqualibus lanceolatis acuminatis striatis ciliolatis extus subviscosis, achænio obtuse 5-angulato glabro.

HAB. On the Morro do Flamengo, near Rio de Janeiro. Fl. in August.

Herba perennis, 2-3-pedalis. Folia 5-6-poll. longa, 2-poll. lata. Petioli 1½-2 poll. longi. Involucrum 2-lin. longum. Pappus stramineus. Achænium nigrum, minute reticulatum.

Allied to E. *Organense*, Gardn. (n. 5777), but with more membranous and more coarsely dentate leaves, and smaller capitula.

5514. Eu. (*Eximbricata*) *vagum*; fruticosum, ramis diffusis teretibus striatis velutino-hirtellis, foliis oppositis petiolatis ovato-oblongis utrinque acutiusculis dentatis supra piloso-scabridis subtus pubescenti-velutinis penniveniis, paniculæ, ramis folio longioribus ultimis corymbosis, capitulis confertis breviter pedicellatis 5-floris, involucri squamis biseriatis inæqualibus basi calyculatis lineari-oblongis obtusis striatis ciliatis glabriusculis, achænio glabro.

Hab. Woods near Tijuca, Province of Rio de Janeiro. Fl. in Dec.

Frutex diffusus. Folia 2-2½-poll. longa, 10-12-lin. lata. Involucrum 2-lin. longum. Pappus sordidus.

This plant agrees with E. *sordescens*, DC. in its rambling habit, but has penniveined leaves, and a more corymbose disposition of the panicles. It has also much fewer flowers.

4859. Eu. (*Eximbricata*) *Adamantium*; fruticosum, ramis teretibus striatis velutino-tomentosis, foliis oppositis petiolatis ovato-ellipticis obtusissimis basi subcuneato-acutis integris vel minute serrato-dentatis supra piloso-puberulis subtus velutino-tomentosis coriaceis penniveniis, venis subtus prominulis, grosse reticulatis, paniculis axillaribus terminalibusque folio longioribus compactis, capitulis longe pedicellatis circiter 12-floris, involucri squamis uniseriatis basi calyculatis linearibus acutis striatis extus piloso-tomentosis, achænio resinoso-punctato.

Hab. Serra da Mendanha, Diamond District, Brazil. Fl. in July.

Frutex 6-pedalis. Folia 3½-4-poll. longa, 20-24-lin. lata. Involucrum 3-lin. longum. Pappus sordidus.

This species is also like E. *sordescens,* DC. in habit, from which its penniveined, broader and obtuse leaves, and fewer flowers distinguish it.

4858. Eu. (*Eximbricata*) *subdentatum*; fruticosum, ramis teretibus velutino-tomentosis, foliis oppositis petiolatis oblongis obtusis basi acutiusculis distanter et subindistincte serrato-dentatis supra piloso-puberulis subtus velutino-tomentosis penniveniis, paniculis axillaribus terminalibusque folio brevioribus, capitulis pedicellatis 10-floris, involucri squamis biseriatis subæqualibus linearibus acuminatis striatis extus piloso-tomentosis, achænio creberrime resinoso-punctato.

Hab. Serra de Piedade, Province of Minas Geraes, Brazil. Fl. in Sept.

Frutex 3-5-pedalis. Folia 2-poll. longa, 10-lin. lata. Involucrum 2½-lin. longum. Pappus rufescens.

Allied to the preceding species, from which it is distinguished by its much smaller and less obtuse leaves, smaller panicles, and fewer flowers.

1738. Eu. (*Eximbricata*) *leptopodum*; caule herbaceo erecto glabriusculo paniculato-ramoso, foliis oppositis alternisque petiolatis triangulari-ovatis acuminatis basi truncatis vel subcordatis ad medium serrato-dentatis utrinque puberulis trinerviis membranaceis, paniculis ad apices ramulorum laxis, ramis gracilibus, capitulis longe pedicellatis 9-10-floris, involucri squamis biseriatis subæqualibus basi calyculatis longe linearibus acutis striatis glabris, achænio ubique pilosiusculo.

Hab. Near Villa do Crato, Province of Ceará, Brazil. Fl. in November.

Annua, 2-2½-pedalis. Folia inferiora opposita, superiora alterna, 10-12-lin. longa, 6-8-lin. lata. Involucrum 3½ lin. longum. Pappus albidus.

4851. Eu. (*Eximbricata*) *Riedelianum*; suffruticosum erectum glabriusculum, ramis teretibus striatis, foliis oppositis petiolatis oblongo-lanceolatis acuminatis basi acutis crenato-serrato-dentatis membranaceis supra glabriusculis subtus

pubescentibus triplinerviis, nervis subtus prominulis, paniculis axillaribus terminalibusque polycephalis, ramis tomentosis, capitulis pedicellatis 5-floris, involucri squamis biseriatis æqualibus elliptico-oblongis obtusis ciliatis extus piloso-tomentosis, achænio pilosiusculo.

HAB. Serro do Frio, Province of Minas Geraes, Brazil. Fl. in August.

Suffrutex 4-6-pedalis. Folia 4-5-poll. longa, 9-12-lin. lata. Involucrum vix 1½ lin. longum. Pappus stramineus.

MIKANIA, *Willd.*

4866. M. (*Erectæ*) *strobilifera*; suffruticosa erecta glaberrima, caule tereti angulato, foliis ternato-verticillatis sessilibus imbricatis oblongo-ellipticis utrinque obtusis integerrimis glaberrimis supra nitidis penniveniis reticulatis venis utrinque prominulis, spicis axillaribus terminalibusque confertis, rachis angulatis pubescentibus, capitulis pedicellatis, involucri squamis oblongis acutiusculis striatis glabris, bracteola iis æquali et conformi, achænio glabro.

HAB. Elevated Campos in the Diamond District, Brazil. Fl. in July.

Suffrutex, 4-pedalis, vix ramosus. Folia 15-20-lin. longa, 8-12-lin. lata, coriaceo-membranacea. Involucrum laxum, 4½ lin. longum. Pappus rufescens.

Near M. *oblongifolia*, DC., from which it is distinguished by its ternate leaves, spicate inflorescence, and glabrous achænia.

4872. M. (*Erectæ*) *lanigera*; fruticosa erecta ad apicem ramosa lanuginoso-tomentosa, foliis ternato-verticillatis breviter petiolatis internodio longioribus ovato-orbiculatis basi cordatis mucronatis vix dentatis subtriplinerviis utrinque cinereo-tomentosis, ramis apice conferto-corymbosis basi foliolosis apice floriferis, capitulis pedicellatis confertis, bracteola lineari obtusa tomentosa ad basin pedicelli eo subæquali, involucri squamis obovato-oblongis ciliatis margine scariosis dorso puberulis, achænio glabro.

HAB. Elevated tracts, Serro do Frio, in the Diamond District, Brazil. Fl. in August.

Frutex 4-pedalis. Folia 15-18-lin. longa, 12-18-lin. lata, coriacea, pennivenia, venis utrinque prominulis. Involucrum 1½-lin. longum. Pappus rufescens.

Near the preceding species, but it is more woolly, and the leaves which are smaller, have shorter petioles, are more deeply cordate, and not reticulated. It has also shorter bracteoles, and the involucral scales are obovate, not oblong.

4871. M. (*Erectæ*) *premnifolia*; fruticosa erecta villoso-tomentosa, ramis teretibus striatis, foliis ternato-verticillatis petiolatis late ovatis obtusis basi cordatis subtriplinerviis reticulatis venis utrinque prominulis mucronatis distanter calloso-dentatis supra piloso-scabridis subtus villoso-tomentosis, paniculis axillaribus terminalibusque parvis in paniculam dispositis, capitulis ad apices ramulorum congestis pedicellatis, bracteola lineari obtusa ciliata ad basin pedicelli eo duplo breviore, involucri squamis oblongis obtusis glabriusculis, achænio glaberrimo.

HAB. Near the Cidade Diamantina, Province of Minas Geraes, Brazil. Fl. in August.

Frutex 4-pedalis. Folia 2-2½-poll. longa, 15-21-lin. lata. Involucrum 1½ lin. longum. Pappus rufescens.

4867. M. (*Erectæ*) *reticulata*; fruticosa erecta subramosa glaberrima, ramis teretibus striatis, foliis ternato-verticillatis vel rariter oppositis breviter petiolatis ovato-rotundatis obtusis basi cordatis imbricatis distanter subdenticulatis penniveniis reticulatis, venis utrinque prominulis, paniculis axillaribus terminalibusque subcorymbosis in paniculam magnam dispositis, capitulis pedicellatis, bracteola lineari-obtusa ad basin pedicelli vix eo æquali, involucri squamis oblongis obtusis, achænio glabro.

HAB. Elevated rocky tracts in the Diamond District, Brazil. Fl. in July.

Frutex 4-5-pedalis. Folia 12-20-lin. longa, 10-18-lin. lata,

coriaceo-membranacea. Involucrum 2 lin. longum. Pappus rufescens.

This comes nearest to M. *Nummularia,* DC., but is very distinct from it and from any published species.

4868. M. (*erectæ*) *flavescens*; fruticosa erecta tota velutino-tomentosa ramosa, ramis teretibus parce striatis, foliis breviter petiolatis rotundatis basi cordatis 3-5-nerviis minute calloso-serrato-dentatis mucronatis non reticulatis, panicula laxa ramis elongatis ramulisque oppositis, capitulis ad apices ramulorum congestis, bracteola minima obtusa, involucri squamis oblongis obtusis dorso aureo-tomentosis, achænio resinoso-glanduloso.

HAB. Elevated Campos between Mendanha and the Ciudade Diamantina, Province of Minas Geraes, Brazil. Fl. in July.

Frutex 2-3-pedalis. Folia diam. 6-12 lin. Involucrum 2 lin. circiter longum. Pappus rufescens.

Nearly allied to M. *Nummularia,* DC., differing chiefly by being more tomentose, the leaves not reticulated on the under surface, and the narrower involucral scales.

4869. M. (*Erectæ*) *Stambana*; fruticosa erecta parce ramosa, ramis teretibus ferrugineo-tomentoso-hirsutis, foliis ternato-verticillatis breviter petiolatis imbricatis late ovatis obtusis basi subcordatis grosse 3-4 calloso-dentatis utrinque piloso-pubescentibus supra nitidis penniveniis reticulatis venis utrinque prominulis, paniculis axillaribus terminalibusque subcorymbosis in paniculam dispositis tomentosis, capitulis breviter pedicellatis, bracteola lineari-spathulata obtusa ad basin pedicelli eo longiore, involucri squamis oblongis obtusis dorso glabriusculis ciliatis, achænio glabro.

HAB. In an upland Campo near Itambe, Province of Minas Geraes, Brazil. Fl. in August.

Frutex 3-4 pedalis. Folia 10-12 lin. longa, 8-10 lin. lata, coriacea. Involucrum 2 lin. longum, squamis margine scariosis. Pappus rufescens.

Near M. *ternifolia,* DC., from which it is distinguished by

its leaves, which are not glandularly punctate, its blunt bracteoles, and its obtuse ciliated involucral scales.

4880 et 5517. M. (*Spiciformes*) *deflexa*; fruticosa glabra scandens, ramis teretibus striatis fistulosis, foliis petiolatis ovato-lanceolatis basi acutis apice obtuse acuminatis integerrimis glaberrimis penniveniis, spicis paniculato-ramosis, ramis oppositis puberulis, capitulis remotiusculis, bracteola lineari-oblonga acuta deflexa invol. triplo breviore, involucri squamis lineari-oblongis acutiusculis glabris ad apicem ciliolatis, achænio glaberrimo.

Hab. Margins of woods near Conceição, Province of Minas Geraes (n. 4880), and woods near Rio de Janeiro (n. 5517), Brazil. Fl. Aug. to Oct.

Frutex scandens. Folia 3-3½ poll. longa, 9-12 lin. lata; vena majora 4, utrinque prominula. Petioli 6 lin. longi. Involucrum 2½ lin. longum. Pappus rufescens.

4881. M. (*Spiciformes*) *puberula*; fruticosa puberula scandens, ramis angulato-striatis fistulosis, foliis petiolatis ovato-lanceolatis basi rotundatis apice acute acuminatis minute calloso-denticulatis utrinque puberulis subtus minute resino-glandulosis triplinerviis, spicis paniculato-ramosissimis, capitulis inferioribus breviter pedicellatis, bracteola lineari-oblonga obtusa pilosa invol. multo breviore, involucri squamis linearibus obtusis dorso puberulis, achænio glaberrimo.

Hab. Margins of woods near Conceição, Province of Minas Geraes, Brazil. Fl. in August.

Frutex scandens. Folia 3-3½ poll. longa, 9-12 lin. lata, membranacea, grosse reticulata. Petioli 5 lin. longi. Involucrum vix 3 lin. longum. Pappus rufescens.

4881. M. (*Spiciformes*) *puberula*; fruticosa puberula scandens, ramis angulato-striatis fistulosis, foliis petiolatis ovato-lanceolatis basi rotundatis apice acute acuminatis calloso-denticulatis utrinque puberulis subtus minute resinoso-glandulosis triplinerviis, spicis paniculato-ramosissimis, capitulis inferioribus breviter pedicellatis, bracteola lineari-oblonga obtusa pilosa invol. multo breviore, invo-

lucri squamis linearibus obtusis dorso puberulis, achænio glaberrimo.

Hab. Margins of woods near Conceição, Province of Minas Geraes, Brazil. Fl. in Aug.

Frutex scandens. Folia 3-3½ poll. longa, 9-12 lin. lata, membranacea, grosse reticulata. Petioli 5 lin. longi. Involucrum vix 3 lin. longum. Pappus rufescens.

Allied to the preceding species, but has a more compact inflorescence, and acutely acuminated leaves, which are besides puberulous and glandular beneath.

4883. M. (*Spiciformes*) *ramosissima*; fruticosa glabra scandens, ramis teretibus angulato-striatis, foliis petiolatis oblongis basi acutis apice obtusis integerrimis margine revolutis triplinerviis utrinque glabris supra nitidis subtus pallidis, spicis paniculato-ramosis, ramis puberulis, capitulis approximatis, bracteola minima, involucri squamis lineari-oblongis obtusis dorso vix puberulis, achænio glabro.

Hab. Serra da Mendanha, Diamond District, Brazil. Fl. in July.

Frutex scandens. Folia 12-15 lin. longa, 4-6 lin. lata, coriacea. Involucrum 1½ lin. longum. Pappus sordidus.

A very distinct species, readily distinguished from the others of the section by its small leaves.

4857. M. (*Ecordatæ*) *coarctata*; fruticosa scandens glabriuscula, ramis teretibus angulato-striatis, ramulis puberulis, foliis petiolatis oblongo-lanceolatis basi obtusis acuminatis quintuplinerviis margine vix denticulatis supra glabris subtus creberrime minute resinoso-glandulosis, paniculis axillaribus terminalibusque parvis in paniculam elongatam dispositis, capitulis subsessilibus, bracteolis parvis ad basin pedicelli ovatis obtusis piloso-tomentosis, involucri squamis linearibus obtusis dorso puberulis, achænio glabro.

Hab. Morro Velho, Province of Minas Geraes, Brazil. Fl. in Sept.

Frutex scandens, ramosissima. Folia 2-2½ poll. longa, 9-11 lin. lata. Involucrum 1½-lin. longum. Pappus rufescens.

4876 et 4878. M. (*Ecordatæ*) *Candolleana*; fruticosa volubilis, ramis teretibus striatis rufo-piloso-tomentosis, foliis petiolatis oblongo-lanceolatis basi acutis acuminatis integerrimis basi et infra medium triplinerviis cæterum reticulatis supra glabriusculis subtus piloso-pubescentibus, paniculis ramos terminantibus opposite ramosis, capitulis ad apices ramulorum 3-5-congestis pedicellatis, bracteolis late ovatis acutis concavis subvillosis pedicello piloso longioribus, involucri squamis oblongis obtusissimis dorso ad apicem villosis, achænio glabro.

Hab. Near Itambe (n. 4876), and in woods near Morro Velho (n. 4878), Province of Minas Geraes, Brazil. Fl. in Aug. and Sept.

Frutex volubilis. Folia 5 poll. longa, 15-18 lin. lata, membranacea. Involucrum $2\frac{1}{2}$ lin. longum. Pappus sordescens.

Number 4878 is more tomentose than the other.

4879. M. (*Ecordatæ*) *Martiana*; fruticosa scandens, ramis teretibus striatis villoso-tomentosis, foliis petiolatis ovato-lanceolatis acuminatis basi subcordatis margine minute calloso-denticulatis 5-7-nerviis supra piloso-pubescentibus subtus villoso-tomentosis, paniculis axillaribus terminalibusque ramis oppositis villosis, capitulis ad apices ramulorum ternis pedicellatis bracteolatis aut medio sessili ebracteolato, bracteola ampla concava, involucri squamis late ovatis obtusis dorso pilosis, achænio glabro.

Hab. Common in bushy places in the Diamond District, Brazil. Fl. in July.

Frutex scandens. Folia 4-5 poll. longa, $1\frac{1}{2}$ poll. lata. Involucrum $2\frac{1}{2}$ lin. longum. Pappus albidus.

This, as a species, ranges along with M. *conferta*, Gardn.

781. M. (*Ecordatæ*) *Ildefonsiana*; fruticosa volubilis, ramis teretibus striatis petiolisque fulvo-villoso-tomentosis, foliis longe petiolatis late ovatis breviter acuminatis basi obtusis vel subcordatis 5-nerviis integerrimis supra adpresse pilosis subtus villoso-tomentosis, paniculis terminalibus, ramis

oppositis inferioribus axillaribus foliis longitudine, capitulis ad apices ramulorum confertis pedicellatis, bracteolis lanceolatis acutis villosis pedicelli duplo longioribus, involucri squamis oblongo-linearibus obtusis dorso ad apicem piloso-barbatis, achænio piloso.

HAB. In woods, by the Aqueduct on the ascent of the Corcovado, Rio de Janeiro. Fl. in July.

Folia 6-7 poll. longa, 3½ poll. lata. Petioli 1½ poll. longi. Involucrum 3 lin. longum. Pappus albidus.

Near M. *Argyreiæ*, DC., but very distinct.

1048. (1). M. (*Ecordatæ*) *complanata*; fruticosa scandens glabra, ramis teretibus angulato-striatis, foliis petiolatis ellipticis utrinque acutiusculis integerrimis glabris triplinerviis subtus pallidis, paniculis axillaribus terminalibusque trichotomis ramis oppositis complanatis puberulis, capitulis ad apices ramulorum confertis pedicellatis, bracteola lineari-oblonga obtusa pilosiuscula invol. breviore, involucri squamis oblongo-linearibus obtusis dorso ad apicem puberulis, achænio glabro.

HAB. In woods near Pernambuco. Fl. in May.

Folia 2 poll. longa, 1-2 poll. lata, membranacea. Involucrum 2-3½ lin. longum. Pappus rufescens.

Near M. *lævis*, DC., but easily recognized by its smaller leaves and larger capitulæ.

4890. M. (*Ecordatæ*) *populifolia*; fruticosa scandens glaberrima, ramis teretibus striatis, foliis longe petiolatis late triangulari-ovatis basi truncatis vel subcordatis breviter acuminatis quintuplinerviis subtus pallidis, paniculis axillaribus terminalibusque, ramis oppositis gracilis compressis, capitulis ad apices ramulorum confertis pedicellatis, bracteola oblongo-lanceolata obtusa glabra invol. duplo breviore involucri squamis oblongo-linearibus obtusis dorso ad apicem puberulis, achænio scabrido.

HAB. In woods at Gongo Soco, Province of Minas Geraes, Brazil. Fl. in Sept.

Folia 4 poll. longa, 2¼ lata. Petioli 1½ poll. longi. Involucrum 2 lin. longum. Pappus albidus.

Near the last species, but differs in the shape of the leaves, the larger and more slender panicles, and whitish, not rufescent pappus.

780. M. (*Ecordatæ*) *nigricans*; fruticosa scandens glaberrima, ramis teretibus striatis fistulosis, foliis petiolatis in sicco nigrescens ovatis basi obtusis apice obtuse acuminatis integris quintuplinerviis glabris utrinque creberrime muricatis concoloribus, paniculis axillaribus terminalibusque in paniculam magnam dispositis, capitulis secus ramulos spicatis subdistantibus, bracteola oblonga acuta invol. subbreviore, involucri squamis oblongis obtusis ad apicem ciliolatis, achænio glabro.

Hab. Climbing on trees upon the Morro do Flamengo, near Rio de Janeiro, Brazil. Fl. in July.

Folia 2½-3 poll. longa, 15 lin. lata, membranacea, nervis subtus prominulis. Involucrum 2 lin. longum. Pappus rufescens.

Near M. *panicalata*, DC., but abundantly distinct.

4889. M. (*Ecordatæ*) *stylosa*; fruticosa volubilis, ramis teretibus striatis rufo-hirsutis, foliis petiolatis ovatis acuminatis basi obtusis vel subcordatis grosse distanter dentatis quintuplinerviis supra sparse adpresse pilosis subtus tomentosis, paniculis ramulos terminantibus, capitulis ad apices ramulorum congestis pedicellatis, bracteolis linearibus pedicelli longioribus, involucri squamis linearibus obtusis dorso puberulis ciliolatis, achænio glabro.

Hab. Among bushes on the Serra das Araras, Province of Minas Geraes, Brazil. Fl. in June.

Folia 2½ poll. longa, 15-18 lin. lata, subtus flavida. Involucrum 2 lin. longum. Pappus sordidus.

This species will range with M. *subcordata*, Gardn.

1344 et 1725. M. (*Cordiformes*) *variabilis*; volubilis, ramis teretibus striatis villoso-pubescentibus foliis longe petiolatis ovato-subtriangularibus acuminatis basi cordatis grosse vel interdum obscure dentatis 3-nerviis utrinque piloso-pubescentibus, paniculis ramulos terminantibus apice

corymboso-umbellatis, umbellis compositis, capitulis pedicellatis, bracteolis ad apicem pedicelli invol. subæqualis lanceolatis acutis, involucri squamis oblongis acutis dorso puberulis ciliatis, achænio resinoso-glanduloso.

HAB. Piassabisu, Province of Alagoas (n. 1344), and between Ico and Crato, Province of Ceará (n. 1725), Brazil. Fl. April to Sept.

Folia 3-5 poll. longa, 1-1½ poll. lata. Petioli 1-1½ poll. longi. Involucrum 1½ lin. longum. Pappus pallide rufescens.

Allied to M. *umbellifera*, Gard. In No. 1344, the branches are less villous, the leaves thicker and not so coarsely dentate, and the flowers smaller than in the other number, but otherwise they are not distinct.

4887. M. *cordiformes* (*Cocaënsis*); suffruticosa scandens, ramis angulato-striatis subvillosis, foliis petiolatis ovatis cordatis acuminatis subdentatis 3-nerviis supra glabriusculis subtus pubescentibus, corymbis ramulos terminantibus trichotomis villosis, capitulis longe pedicellatis, bracteolis ad apicem pedicelli lanceolatis acuminatis invol. paulo brevioribus, involucri squamis lineari-lanceolatis acuminatis dorso pubescentibus, achænio glaberrimo.

HAB. Near Cocaes, Province of Minas Geraes, Brazil. Fl. in August.

Folia 3-poll. circiter longa, 15-18 lin. lata. Petioli subpollicares. Involucrum 4½ lin. longum. Pappus rufescens.

Near M. *gonoclada*, var. *β. ambigua*, DC.

4884. M. (*Cordiformes*) *salviæfolia* ; fruticosa volubilis, ramis teretibus striatis junioribus villosis, foliis petiolatis ovatis basi cordatis apice subattenuatis obtusis infra medium crenato-dentatis triplinerviis supra puberulis subtus lanuginoso-tomentosis, paniculis ramulos terminantibus parvis, capitulis pedicellatis, bracteolis ad apicem pedicelli ovatis acutis ciliatis dorso pubescentibus invol. duplo brevioribus, involucri squamis obovato-oblongis obtusis ad apicem ciliatis dorso pubescentibus, achænio glabro.

HAB. Near San Romão, on the banks of the Rio San Francisco, Brazil. Fl. in July.

Folia 2-3 poll. longa, 12-15 lin. lata. Petioli 9-12 lin. longi. Involucrum 3 lin. longum. Pappus rufescens.

Near M. *convolvulacea*, DC., from which it differs in having narrower leaves, which are besides tomentose on the under surface. The bracteoles and involucral scales are also very unlike.

4885 et 4886. M. (*Cordiformes*) *divaricata*; volubilis, ramis teretibus striatis hirsutis, foliis petiolatis late ovatis cordatis obtusis vel acutiusculis crenato-dentatis 3-nerviis supra piloso-pubescentibus subtus subtomentosis, paniculis parvis compactis longe pedunculatis in paniculam magnam dispositis, capitulis breviter pedicellatis, bracteolis linearibus invol. duplo brevioribus, involucri squamis oblongis obtusis dorso puberulis ciliolatis, achænio vix piloso subresinoso-glanduloso.

HAB. Serra das Araras (4885), and near Formigas (4886), Province of Minas Geraes, Brazil. Fl. in June and July.

Folia 2-3½ poll. longa, 1½-2¼ lata. Petioli subpollicares, hirsuti. Involucrum 1½ lin. circiter longum. Pappus rufescens.

Near M. *microcephala*, DC. In number 4886, the flowers are a little smaller, and the achænia more pilose and less glandular than in the other number.

4875. M. (*Cordiformes*) *sepiaria*; fruticosa scandens, ramis teretibus striatis petiolisque fulvo-hirsutis, foliis late ovatis basi profunde cordatis lobis approximatis apice longe acuminatis minute calloso-denticulatis supra sparse adpresse pilosis subtus villoso-strigosis 5-nerviis, paniculis axillaribus terminalibusque gracilis villosis, capitulis secus ramulos breviter racemosis pedicellatis, bracteola ovato-lanceolata acuta striata glabriuscula longe ciliata paulo infra invol. et eo vix æquali, involucri squamis lineari-lanceolatis acuminatis striatis glabris, achænio glabro.

HAB. Common in hedges and bushy places about Ciudade

do Serro, Province of Minas Geraes, Brazil. Fl. in August.

Folia 8 poll. longa, 4¼ poll. lata. Petioli circiter 2-pollicares. Involucrum 2½ lin. longum. Pappus albidus.

Near M. *affinis*, Gardn.

782. M. (*Angulatæ*) *maritima ;* volubilis, caule tereti striato glabriusculo, foliis petiolatis basi cordatis in sinu subcuneatis trinerviis hastato-trilobatis lobis obtusis mucronatis calloso-dentatis supra glabriusculis subtus cinereo-piloso-subtomentosis eleganter reticulatis, corymbis ramulos terminantibus villosiusculis ramulis apice tricephalis, capitulis pedicellatis, bracteola subulata fere ad apicem pedicelli et eo subæquali, involucri squamis oblongis obtusis striatis dorso puberulis, achænio glabro.

HAB. Among bushes on the Copo Cabana beach, near Rio de Janeiro. Fl. in July.

Folia 2½-3½ poll. longa, 2-2½ poll. lata. Petioli subpollicares. Involucrum 3 lin. longum. Faux corollæ infundibuliformis. Pappus rufescens.

Near M. *angularis*, H. et Bonp.

4888. M. (*Angulatæ*) *campanulata*; volubilis, caule striato pubescente, foliis petiolatis basi cordatis in sinu subcuneatis 3-nerviis hastato-subtrilobis lobis obtusis subdenticulatis supra glabris subtus vix reticulatis puberulis, corymbis ramulos terminantibus in paniculam magnam dispositis pubescentibus, capitulis longe pedicellatis, bracteola lineari-subulata acuta fere ad apicem pedicelli et eo multo breviore, involucri squamis oblongis obtusis dorso puberulis, achænio glabro.

HAB. Near Ciudade do Serro, Province of Minas Geraes. Fl. in August.

Folia 4 poll. longa, 2 poll. circiter lata. Petioli 1½ poll. longi. Involucrum 2½ lin. longum. Faux corollæ late campanulata. Antheræ exsertæ. Pappus rufescens.

Near the preceding species, but easily recognizable by its scarcely reticulated leaves, smaller heads, and the broadly campanulate throat of the corolla.

6047. M. (*Angulatæ*) *Pernambucensis*; fruticosa scandens glabra, ramis acute 6-angulatis striatis, foliis petiolatis basi truncatis aut subcordatis 5-nerviis late hastato-trilobatis, lobis lateralibus parvis obtusis, intermedio multo majore acuminato, utrinque glabris, paniculis axillaribus terminalibusque in paniculam magnam dispositis puberulis, capitulis secus ramulos sessilibus spicatis, bracteola lineari acuta invol. dimidio breviore, involucri squamis linearibus acutis glabris ad apicem ciliatis, achænio glabro.

HAB. Woods near Pernambuco, Brazil. Fl. in June.

Folia 4-5 poll. longa, 2½-3 poll. lata. Petioli 12-15 lin. longi. Involucrum 2½ lin. longum. Pappus rufescens.

Near M. *hederæfolia*, DC.

4873 et 4874. (*Angulatæ*) *hispida*; fruticosa scandens, ramis teretibus petiolisque hispido-tomentosis, foliis petiolatis cordatis acuminatis late hastato-trilobis, lobis lateralibus parvis, margine revolutis minute calloso-dentatis triplinerviis supra sparse adpresse pilosis subtus villosis reticulatis, paniculis axillaribus terminalibusque in paniculam magnam dispositis hispido-tomentosis, capitulis ad apices ramulorum congestis breviter pedicellatis, bracteola ovato-rotundata acuta concava ad apicem pedicelli invol. duplo fere breviore, involucri squamis oblongis obtusis dorso pilosis, achænio glaberrimo.

HAB. In woods at Gongo Soco, Province of Minas Geraes, Brazil. Fl. in Sept.

Folia 4-6 poll. longa, 2½-3½ poll. lata, subtus pallida. Petioli 12-15 lin. longi. Involucrum 2 lin. longum. Pappus sordide albidus.

This, as a species, will rank with the preceding and with M. *hederæfolia*, DC.

The following is a list of the names of those *Compositæ* belonging to the tribe *Eupatoriaceæ*, in my Brazilian collections, which I have ascertained were previously described.

5773. Stevia *Organensis*, Gardn.

1722. Ooclinium *Sideritis*, DC.

493. Conoclinium *betonicæforme*, DC.

870. 1048. 1341. 1342. 2420. Conoclinium *prasiifolium*, DC.
5510. Hebeclinium *macrophyllum*, DC.
487. 1777. Bulbostylis *glabra*, DC.
486. 2747. Eupatorium *Maximiliani*, Schrad.
489. 5515. „ *pallescens*, DC.
771. „ *consanguineum*, DC.
1723. „ *adenanthum*, DC.
1968. „ *conglobatum*, DC.
2644. „ *psidiifolium*, DC.
4852. „ *conyzoides*, Vahl.
5511. „ *paniculatum*, Schrad.
5513. „ *læve*, DC.
779. 5516. Mikania *lævis*, var. *angustior*, DC.
1724. 2646. 4885. Mikania *convolvulacea*, DC.
2421. Mikania *polystachia*, DC.
2901. „ *officinalis*, Mart.
4870. „ *sessilifolia*, DC.
4877. 4882. „ *Buddleifolia*, DC.
6048. „ *umbellifera*, Gardn.

Kandy, Ceylon, May 27th, 1846.

BOTANICAL INFORMATION.

Journey from Oeiras, through Cachias, to San Luiz, the Capital of Maranhão; (from the Travels of DR. VON MARTIUS).

The hospitable inhabitants of Oeiras strove to show their kindness by presenting us with such stores of provision, that twice our number of mules would have been requisite to carry away the stock of fresh and salted provisions that was bestowed upon us. Such is the abundance of cattle in this country, that a custom prevails of leading a fine ox to the door of the stranger, and there offering him as large or as small a share of the animal as he will accept.

The first night was passed at only a league's distance from the city, at a place on the hill called Olho d'Agoa. This hill, traversed by a steep, ill-made road, is said to contain much gold in its sifted sandstone courses of quartz; the inhabitants, however, have for many years ceased to make any search for it, nor are the numerous gold mines, originally discovered by the first conquerors of this country, any longer wrought. The similarity between the vegetable productions of this district and those of Minas Geraes, certainly favours the idea that this valuable metal does exist here, though perhaps in very small quantities.

On the 12th of May, at Inhuma, seven leagues distant from Oeiras, we crossed the Rio Caninde, here an insignificant stream. In general features, the country much resembles what we had seen before reaching Oeiras; ponds, however, are more frequent in the vallies and together with the *Carnaiiva Palm*, the *Buriti* and *Uricuri* (*Mauritea flexuosa*, L. and *Attalea compta*, M.) unite to form extensive forests, which give both a peculiar and majestic character to the landscape. Here, too, were sandstone hills, rising in successive terraces, their lofty tops flattened into extensive plains, while between these elevations lay wide valleys, whose grey-green vegetation strikingly contrasted with the red colour of the stone. It was more and more visible on this track how the elevated part of Piauhy differs in its *Mimosa* vegetation from the lower Piauhy, where the *Agreste* every where prevails.

To the left lay the isolated Serra de Mocambao, of which we made the circuit, passing through many of the declivities and lower parts of the mountain, where we had to wade through crystal brooks, and were frequently obliged to make our way with difficulty on the swampy paths, through unexplored and untracked woods. We often saw on the sandstone many large pieces of very beautiful *Fortification Agate*. Not being always able to reach a farm at night, we were obliged to pass the hours of darkness in the open air, and the rain which regularly fell between sunset and midnight, was by no means favourable to the removal of our feverish symp-

toms. On the 15th of May, after climbing the sandstone mountain, the Serra de S. Goncalo, we found ourselves, after descending on the other side, in the little *Arayal* of the same name, which is a square of low loam cottages, around a decayed chapel, the former dwellings of an Indian colony.

The grandfather of the present Capitan Major of Oeiras, fifty years ago, waged war against several races of Indians, then resident in the western districts of the province, and who by their frequent attacks had become dangerous neighbours to the settlers. Those prisoners, captured in the assault, one thousand five hundred in number, were, according to the custom of the times, sent altogether away from their native place and settled in villages, called *Aldeas*. Of the formerly powerful tribe, called the Pamelas, we found only a feeble remnant left; according to the clergyman's list, they are but one hundred and twenty in number, and even some of these are not of unmingled descent. Diseases of various kind, and particularly the small pox, have committed great ravages among them, and others have long ago returned to their original abode. The mournful spectacle of these poor few Indians, creeping about, doing nothing, the dirt and confusion which pervade their sorry dwellings, and the want of kindness which they experience at the hands of their captors, who confide the charge to a set of drunken soldiers; all these only confirm me in the belief that it is almost impossible to colonize successfully a set of uneducated natives. The friend of humanity must ever deplore the cruelties and loss of life which attend these colonizations. No race of Indians has ever become peaceable subjects until they were, in the first instance subdued by force of arms. To effect this purpose, *Bandeiras* (or troops under a banner) have been levied, the State furnishing them with accoutrements and ammunition, and the peasants supplying the needful provisions to prosecute the war for many months. Sometimes whole herds of bullocks were driven to the campaign. The military seldom prosecute their march with any view of coming to an open battle, but rather in such a manner as to

surprize the Indians in their remote and scattered dwellings. Should the campaign prove successful, the conquered are obliged to yield to their victors, acknowledge the superiority of the Brazilian Government, and submit to be settled in the different *Aldeas*, which are generally selected at the greatest possible distance from their own native place, and from the Brazilian residences. Here the Indians are placed under the charge of a Director, appointed for the purpose, who instructs them in agriculture; they must also receive tuition in the Christian Faith from the priest. What fruit can be reaped from such compulsory teaching, either in religion or agriculture? The Brazilians demand from the natives an instant surrender of all their hereditary inclinations, manners and customs, and claim their submission to a law and a faith whereof they know nothing. It follows, of course, that the more resolute and daring among these captives endeavour to escape as quickly as possible from such intolerable restraint; while those who remain among the Brazilians, without associating with them, live like strangers and aliens, and pine away in the most wretched state of moral and physical degradation. It is only a powerful moral impulse that can be expected to operate a favourable change in these neglected sons of the forest; and unhappily it is seldom that either inspector or priest knows how to give such an impulse. The captives, left to themselves, quickly forget their original mode of life, but receiving no instruction in a better course, they speedily deprive themselves, by idleness and habits of intoxication, of even the small share of mental energy which they possessed when roaming free in their native woods. The disastrous results of the attempts at colonization by *Aldeas*, prevalent almost throughout Brazil, naturally suggested the desirableness of another plan, by which the Indians, instead of being kept all together, are distributed among the *Fazendeiros*. This latter method is adopted by the present Governor towards the *Pimenteiras*, who, so early as the year 1775, rose in rebellion from time to time, and attacked the settlers near the Rio Piauhy. Part

of them were compelled, by Jose Dias Soares, to acknowledge the supremacy of the Portugueze Crown, but the greater number still ramble about in savage independance, and are occasionally captured by the *Fazendeiros*, who are empowered to make them work as slaves, or to sell them. A similar mode of treatment has been pursued with the Cannibal *Botocudos*, who, in the province of Minas Geraes, cruelly attacked the neighbouring settlers, and were in their turn vanquished, and either reduced to slavery or sent to work in the mines. These people are of a warlike disposition and distinguished by their custom of boring the under lip and ears.

At Oeiras we saw several *Pimenteira* prisoners. They were more active and stronger built than the generality of Indians whom we had observed, and showed greater animation in their ccountenances and manner of speech, than belonged to their brethren settled in *Aldeas*. They were of the tribes *Gogues* and *Acroas*, and it was only through the medium of their superintendant, Marcellino—a very aged man, who appeared to have some mixture of the Ethiopian blood in his Indian veins—that we could obtain any communication with them. The *Gogues* lived (and some still reside,) near the southern parts of the Rio Parnahyba; and, so late as the year 1765, four hundred of them assembled at an Aldea, nine leagues north of Oeiras. The *Acroas* again inhabit a district north of the *Gogues*, between the Rio das Balsas and the Tocantins; while the *Timbiras* are a nation widely diffused in the Sertão of Maranhão. According to the aged Marcellino's statement, all these Indians use the bow and arrow for their weapons, often poisoning the latter; and they support themselves by hunting and fishing, being much averse to agriculture. When they cross the Rio Tocantius, it is not in canoes, of which they hardly know the use, but on rafts, which they construct of the stems of the *Buriti Palm.* They are not Anthropophagi, but employ their prisoners as slaves. According to an old tradition of these Indians, God, at

the beginning of all things, is said to have constructed a lofty house, rising to Heaven, from whose ruins proceeded all kinds of animals, and the various nations of mankind. Marcellino further asserts, that they have an idea, though very indistinct, of an infinitely exalted Being, on whom they call in times of distress and danger, clasping and uplifting their hands, and kneeling or throwing themselves along upon the ground. They also admit the existence of an evil spirit, or demon. It was impossible for us to ascertain how far our informant introduced the statements of the Old Testament in these his descriptions.

At San Gonçalo d'Amarante, a traveller on foot came up to us, begging leave to make the journey to Cachias under the protection of our caravan. He was a man, as it appeared to us, of pure European extraction, and advanced in years, whose aspect, as he carried his little baggage, and pursued his lonely way in this inhospitable land, struck us as extremely singular. In his mute gestures lay the expression of uncontrollable terror, and our close observation, with combining together the disjointed words that dropped, as it were, from his unconscious lips, enabled us, finally, to ascertain that this unhappy being was a citizen of Bahia, who had suffered shipwreck on a voyage to Maranhão. During this calamity, his wife had been drowned in his sight, and his daughter was carried off by a devouring shark. He had himself lost his way, how he knew not, and wandered from the coast to this place. The horrible catastrophe had so engrossed the poor creature's mind and affected his intellects, that he often woke us at midnight with his fearful outcries. This mournful companion, whose presence our humanity made us willing to endure, was an appropriate omen of the misery that increasing malady would soon bring upon us.

On the 16th of May, I made a deviation from our route, and struck into the adjoining primitive forest. Here I observed a yellow sandstone rock, thickly coated with saline matter, which proved, on chemical examination, to consist

chiefly of saltpetre; and while I was engaged in pointing out to the Fazendeiro, at Corté, where our bivouac had halted, the important article of commerce which this material would afford, I felt myself violently attacked with the premonitory symptoms of an acute fever, which soon afterwards deprived me of all consciousness. An emetic was administered, in the vain hope of warding off the malady; and, by dint of great exertions, I pursued my journey on horseback for two days, passing the Faziendas Buriti and San Pedro, in order to gain Todos los Santos. The dreadful sensations, violent vomiting, mortal depression, and prostration of strength, compelled me perpetually to alight from my beast, and extend my weary frame on the ground. At the same time, one of our servants being similarly attacked, we had no alternative but to halt at the last named farm. My brain was so much affected that Dr. Spix, who nursed and attended me with the most sedulous care, was apprehensive that my disease would prove to be a nervous fever; but the rest which I obtained at Todos los Santos, appeared to give a new turn to the complaint, which, after several days, settled into a confirmed ague, coming on solely in the evening, but always accompanied with distraction of the *sensorium*, and unusual prostration of strength. With our poor servant, matters went on much worse: he was seized with the most dreadful convulsions, attended with locked-jaw, raving, frenzy, and apoplexy, and died on the fourth day. To fill up the measure of our sorrows, my faithful friend and companion also fell ill, after bathing in a shallow pool of water; his body being covered with painful boils, which were acutely inflamed. Under such circumstances, all our efforts were turned to effecting our escape from the damp and unwholesome atmosphere of the Palm-woods, and proceeding to Cachias with the utmost speed; but as we could not keep ourselves upright in the saddle, we were obliged to hire negro slaves from the neighbouring farms, who carried us upon mats, slung between poles. It is impossible to describe the anguish of mind which we suffered, each seeing

the other's illness, and incapable of doing anything to afford relief, racked with anxiety for the future, and worn with excruciating pains. Thus did we travel onwards, till we reached the Fazenda Sobradinho, on the Rio Parnahyba, (Parnaiba) the largest river between the Rio de St. Francisco, and the Tocantins, and which, in its extensive course, forms the boundary of the provinces of Piauhy and Maranhão. It here rolls its muddy, yellowish waters between thickly bushy and rising shores, to the breadth of about two hundred feet; and though much contaminated by earth and soil, it yet affords the only drinkable water to those who live near, and who are consequently often seized with ague. Our servants, whom the necessary care of the luggage obliged to pass a night on the banks of the Parnahyba, immediately evinced the baneful effect of its atmosphere.

In the numerous farms situated to the south-west, upwards along its banks, and where formerly the sole attention of the proprietor was directed to the rearing of cattle, they now cultivate much cotton. The Parnahyba is rather rapid, but without any waterfalls; downwards from the south-west part of the Province of Piauhy it flows chiefly through a low, swampy country, covered with primitive forests and dense bushes, or with groves of the *Carnaiiva* and *Buriti Palms*. The Brazilians only know this river accurately, as far as where the *Rio das Balsas* joins it, the upper districts being almost entirely uninhabited or only partially occupied by hordes of Nomade Indians, belonging to the tribes of *Acroas* and *Gogues*. It is navigated upwards by boats; but downwards, chiefly by Floats and *balsas*, constructed of the stems of the *Bariti Palm*: its bed is level and the navigation good for vessels of burdens from 3 to 5 cwts. The principal trade consists in skins, leather, salted meat, tobacco and cotton, which is obliged to be carried from the river to the sea, the only sea-port of the Province of Piauhy being the Villa de S. Joa do Parnahyba. Doubtless the trade would be considerably greater if there were better access from the ocean. But the river disgorges its waters through six mouths, all rather

shallow, varying from two to four fathoms in depth, and often only allowing the passage of *Sumacas* and other small craft, when the tide is deep and the water high.

Here, as at Joazeiro, there is a toll paid for crossing the Parnahyba, which is farmed out by government. The charge for each passenger is but small, and his luggage is put across for nothing. On reaching the north shore, we were in the Province of Maranhão, and after pursuing our way for about six leagues, we met at the *Fazenda Sucuriu*, an official personage, the commandant, who commiserating our feeble state, showed us much kindness. His good intentions, however, had like to have proved the death of Dr. Spix, for he recommended the use of an ointment, to mitigate the pain caused by his inflamed ulcers, without giving us any correct directions for its application. About noon we left his hospitable roof and proceeded about three leagues further to Perdido, where we were obliged to encamp in the open air, without shelter, and suspend the nets for our hammocks to trees. This had hardly been done, when evening closed in dark and gloomy, and a fearful storm burst forth. The rain quickly penetrated the leaves overhead, and the wind, after extinguishing our fire, threatened to overturn our slight shelter. I clung fast to my thoroughly soaked bed, too weary to quit it; when near midnight, our French attendant, the only attached and faithful person around us, roused me to fearful consciousness by his exclamations that Dr. Spix was dying. When I hurried to him in great alarm, I found him cold and pale as death, motionless and seized with dreadful spasms, the hard places on his body showing that the application of the ointment had been of almost a poisonous tendency. Immediate aid was doubtless necessary; but how was it to be obtained in this desert place, with the elements raging all round us with the utmost fury? Necessity, however, is the mother of invention; I sent back some of the negroes to the last Fazendas, to procure what was requisite for making a bath, and in the meantime, I pounded down a quantity of sulphur that we had brought from Rio for the

purpose of fumigation and destroying insects, and administered it to the patient, mixed with large doses of tincture of opium. By this remedy and continual friction with warm cloths, we succeeded in restoring animation and consciousness, and when towards morning, I obtained the means of applying warm fomentations, I had the inexpressible satisfaction of witnessing the removal of the spasms and the diminution of the disease on the skin. We were, however, nine leagues distant from *Villa de Cachias*, and as without proceeding thither, it was impossible to procure aid for the transportation of Dr. Spix, so it was indispensable for me to set off. Nothing indeed was to be done, unless I should myself go there as quickly as possible; so with a heavy heart, I promised to return without delay, and bidding my friend farewell, I was lifted upon the horse and started on my lonely journey. To my sorrow I found that the agitation and distress of the previous night conspired to increase my feverish symptoms, and the burning rays of a tropical sun proved almost intolerable. At first my course lay through extensive Palm forests, now full of water from the heavy rains, then over several ranges of hills, covered with bushes. I suffered the torments of thirst, like another Tantalus, for I dared not alight from horseback to drink, lest weakness should prevent my mounting again. Evening approached ere I reached Cachias, for riding up a steep hill, I missed the narrow track and roamed among tall tufts of grass till night came on, and there I was wandering and ill in the gloomy wilds! With the despondency that followed my late sufferings, I gave up any endeavour to regain the track, and had just determined to lie down under the shelter of a low tree, when I heard the sound of a person whistling; and, exerting my voice to summon him to my side, a negro appeared, swinging a fire-brand and actually on his way through the forest, carrying medicines from Cachias. This happily-found guide accompanied me back to the road, and at last I beheld the lights of the Villa gleaming before me, and alighted at the house of the worthy Senor Luiz de Oliveira. To him I presented my letters of recommendation,

but had hardly done so, ere I fell down fainting before him, and did not recover till I found myself in bed in a neatly furnished apartment, with a person who was administering remedies to me, and who addressed me in English. He was a Portuguese physician, who, after studying in Edinburgh, had recently settled at Cachias. Thanks to his kind and skilful care, I quickly revived, and next morning had the comfort of seeing Dr. Spix arrive in a tolerable state of convalescence; he was brought by the slaves who had been sent to fetch him. The kind care of the physician and the new judge, Señor Francisco Gonzales Matins, who had left Bahia after us, coming hither by sea, (in accordance with the custom throughout Brazil, which changes the residence of a judge every three years,) speedily produced an improvement in the health, both of Dr. Spix and myself.

Cachias is one of the most flourishing towns in the interior of Brazil, and possesses a population, calculated at 30,000 souls. Its prosperity is mainly due to the company of merchants of Maranhão and Para in the Province of Maranhão, aided by twenty years' cultivation of Cotton; a branch of industry pursued with much spirit, and to the prosecution of which the inhabitants are incited by the many Europeans settled among them. Above half the cotton raised in the whole province finds its way through Cachias to the capital; and during the last few years, the number of bags, shipped from this place, each weighing from five to six arrobas, averages from 25,000 to 30,000, the value of which, at the lowest estimate, amounts to the sum of £1,640,000, or nearly two millions of florins. The cotton of Maranhão, including the produce of Parnahyba, Rio Grande, Rio do Norte and Ceara, is considered superior to what is grown in any part of the Brazilian Empire, with the exception of Pernambuco. The latter article is more carefully sorted and cleaned, and its texture is somewhat finer; but the staple is shorter, thus rendering it best adapted to the manufacture of delicate articles, in which durability is not particularly requisite. The Maranhão cotton produces a strong, tough, white

thread, fit for making stockings and coloured goods; for which reasons it ranks in value next after that of the Sea islands of Georgia and Bourbon; while that from Pernambuco is equal to the best kinds of Bahia, Cayenne and Surinam cotton, far excelling the West and East Indian, the North American and Levantine produce. While we were here, the export, particularly to Liverpool, was uncommonly brisk; and the subsequent dullness which took place in the sales, was very sensibly felt.

The *Cotton Shrub* of Maranhão belongs to those varieties which produce *black seeds,* and of which it is not certain whether a specific difference exists between the shrub and the Pernambuco kind (*Gossypium vitifolium,* Lam.) Perhaps it is G. *purpurascens* (G. *racemosum,* Poir.?) The seeds, mostly nine in a cell of the capsule, are covered on the upper surface with long wool, whose pure whiteness is not frequently changed to a pale yellowish hue by the constant rains. The proportion of cotton wool to the seeds is particularly large, for while four pounds of Pernambuco seeds produce one pound of pure wool, the same weight is obtained from only *three pounds of the seeds of Maranhao cotton.*

The culture of this valuable shrub (*the Cotton plant*), extends almost all over the globe. It is pursued, not only throughout tropical countries, but in North America, so far as the 40th degree of latitude, in Sicily, in some districts of Naples and Spain (lat. 41°) and under the same degree of latitude it grows in Asia Minor, Persia, China and Japan. In the southern hemisphere, this valuable plant thrives in the province of Rio Grande do Sul, in Brazil (according to Aug. de St. Hilaire), as far as the 31° degree of latitude in South America; while in the continent of Africa, it grows at the Cape of Good Hope, and may be seen extending its limits over many districts of the Australian Colonies, considerably farther from the tropics than the latitude above named. This consideration lends peculiar interest to the mode of its culture, and it may therefore not be amiss here to state some particulars of the growth of the cotton plant in

Maranhão, and to compare it with the plan pursued in the Province of Pernambuco.

Those districts in Maranhão which are preferred for raising the *Cotton-shrub* are the low wet grounds, where *Adaja Palms* (*Attalea compta*, Martius), prevail. The soil generally consists there of black earth, mixed with fine quartz sand; and these districts bear the same name as in Pernambuco (*Vargenes*). The first process is to root up and burn all other trees and bushes; and in the month of January the seed is sown; five, six, or even twelve seeds being dropped into one hole, from 3 to 4 inches deep; and the holes at a distance of 5 or 6 feet, generally without any regular order. At Parnahyba, Pernambuco, and Rio Grande do Norte, where the culture of the *Cotton* receives peculiar attention, they plant the seeds in holes, set in a regular quincuncial order, and in long furrows, 14 feet apart in wet soil, in the Catingas 8 feet, and on dry sandy soil, but 6 feet from each other. It is necessary to avoid depositing the seeds at too great a depth, when they always rot; for which reason, the plantations in wet districts are surrounded by drains.

Frequently the Fazendeiro raises *Beans*, *Maize*, or even *Mandioicca* in the spaces which intervene between the *Cotton-shrubs*. The seed, which is of very rapid growth, appears above ground in a few days, fourteen at most, and the young plants make very quick progress. Under favourable circumstances, the *Cotton-shrub*, if left to itself, continues in perfection from twelve to thirteen, and sometimes even twenty years, flowering, and (if strong) bearing fruit twice annually; and as those plantations which are situated among close, damp, primitive forests, are always later than others in dry and loftier spots, so the Fazendeiro who cultivates it extensively, can employ his negroes in collecting the produce throughout half the year. The crop commences, in the Province of Maranhão, about ten months after the sowing; the seed is committed to the earth in the period between September and November, and the principal harvest takes place in July and August. A good deal is often mature

before that time, and even so soon as five or six months after sowing, but the cultivators do not generally gather it. At Pernambuco, it frequently occurs that the heavy rains abate in May, and then an early harvest of the ripening fruit commences, of which the produce is called *Safra do Maio* ; but is not much esteemed, in consequence of its yellowish colour. That cotton which the shrub yields the first year, is generally considered to be the best. The strongest shrubs will afford, at the first harvest, 8 lbs. each of seed, giving 2½ lbs. of clean wool ; and the weakest 1 lb. of seed, (5 oz. of pure cotton).

Such is the prolific and certain nature of the cotton crop, as it exists here in tropical regions, that many Fazendeiros never pay any attention whatever to their plantations till the harvest season arrives ; or, at most, the slaves are set to pull up the superfluous plants where they spring too thick, and to break off the top or leading shoot. This remissness of the Fazendeiro, thus relying solely on the productive bounty of the soil, is sometimes punished by that very circumstance ; for the fertility of the ground causes the whole *Algodoal* (or cotton plantation,) to grow so high, and interweaves the shrubs with such a dense mass of climbing weeds, that it forms an impenetrable thicket, through which it is impracticable to force one's way to gather the pods. The diligent cultivator, on the contrary, here, as in Pernambuco and Parnahyba, cleans the ground from weeds twice a-year, viz : at the beginning and end of the rainy season. Those weeds which are found most pernicious in the *Algodoals*, are the various *Convolvulaceæ*, (here called *Getirana*,) as *Ipomæa Quamoclit*, *L.* and *I. hederacea*, R. Br.), the plant termed *Erva de San Gaetano* (*Momordica macropetala*, Mart.), *Grasses*, and other low annuals, (*Bucholzia ficoidea*, and *Polygonoides*, Mart., *Alternanthera*, *Achyranthes*, R. Br.) &c.

By the careful cultivator, in addition to weeding, two other precautions are used in this district, as in the more southerly parts of Brazil, in Surinam, and Cayenne. They consist in breaking off, as before mentioned, the upper central shoot, and after the shrub has borne fruit, in re-

moving part of the fructiferous branch, which is apt, unless vegetation is particularly powerful, to remain barren and half dried up. The first process (*capação*) answers the double purpose of checking the growth at a height o 5 or 6 feet, and inducing the shrub to throw out numerous horizontal branches, by which a greater number of flowers, and these developed at the same time, are produced, than as if the shrub was permitted to produce its central stem ; and also facilitating the operation of gathering the pods or capsules (*macana*). The removal of those branches which have borne seeds is effected at the commencement of the rainy season, when the sap is in circulation and the growth is quickest; and it has the effect of concentrating the vital juices on those portions of the plant which are still to yield fruit.

It is seldom that here, except under very favorable circumstances, a cotton plantation is used longer than three or four years; at the end of which time the stems begin to grow weak, and in order to promote their improvement, the shrubs are cut down close to the root, or only a foot or two feet above it, thus forcing the plant to throw up fresh and bearing branches. This operation, called *decolaçao*, and practised in all countries where the *Perennial Cotton Shrub* is cultivated, (as in Natolia, in North America, and Surinam), is not so universally prevalent in the more northern provinces of Brazil, Pernambuco, Parahyla and Rio Grande do Norte, where the grower, favoured by the almost incredible fertility of the land, and the ease with which new cotton plantations may be formed, rather pursues the plan of making fresh *Algodoals* than seeking to improve the old ones. The country is, generally speaking, so eminently blessed by nature, that not seldom the harvest exceeds expectation, and the proprietor finds a difficulty in gathering it in, and disposing of it. The pods are collected by negro slaves, each of whom is able to gather between one and two *arrobas* daily.

It must, however, be remembered, that even here the cultivation of cotton has to contend with many disadvantages.

An unusually protracted rainy season, or even heavy and continuous night-dews during the dry time, are apt to prevent the flowers from forming into fruit; or the wet forbids the pods from expanding, and decays the cotton inside. Equally with long damp, the bright rays of the sun during rain will occasion the half-ripened pods to drop off; while various diseases, to which the fruit is subject, especially those, technically termed *cancer* and *jaundice*, frequently blight the hopes of the cultivator and materially diminish his gains. Both these diseases generally arise from excess of moisture. Birds, caterpillars, grasshoppers, and the bug, infest the plantations from time to time; and though they are minute enemies, they effect much injury; while the gathered crop is often in imminent danger from that destructive animal, the rat, whose well-known subtlety eludes the *Fazendeiro's* precautions. As the kernel of the seed is the object of the rat's attacks, the best method of securing the pods is to shake a stratum of the kernels, divested of cotton, over the others.

The separation of the pure wool from the kernels was formerly performed by a very simple process, namely two rollers, passing over each other in opposite directions, and set in motion by the hand; but now, the *Fazendeiros* often use machines, more or less complicated, though constructed on the same principle. In like manner, the packing of the cotton into bags of coarse cotton cloth was formerly done by the negroes, who trode the substance into the moistened and suspended bags, which it required all the efforts of their feet to fill at the rate of one a-day; whereas presses are now always used for the same purpose. The real intrinsic value of the cotton, when clean and packed, fit for exportation, was stated to me, by an accurate Portuguese farmer, after deducting the expense of its production, at 3,300 réis, or rather more than 9 florins.

One evening, during the earlier part of our residence at Cachias, we were attracted to the window by a bellowing noise in the street, where we beheld the singular sight of a

horde of about fifty Indians, in all the nakedness and wildness of their savage nature. These poor creatures are permitted occasionally by their masters to come down from the woods, between the Rio Méarim and the Rio das Alpercatas, in order to purchase for themselves, from the inhabitants of the town, different articles of clothing, hatchets, knives, and all kinds of little utensils; in return for which, they give large cakes of wax, beautiful coloured feathers, and elegantly carved bows and arrows. Similar processions not unfrequently take place, and they are one of the plans adopted by the settlers for the purpose of keeping in good humour these original lords of the soil. On a late occasion, they were so fortunate as to establish a friendly intercourse between the free Indians of the Province Maranhão and the settlers; prudence requiring that the ancient hostile hordes should be pacificated by all practicable measures. Thus, when the Indians whom we saw, came to Cachias, they received liberal presents of flour, brandy, tobacco, and coloured cottons. These natives belong to two allied tribes, the *Aponegi-crans* and the *Macamo-crans*, the latter also called *Carumés*. Their forms were so strong and symmetrical, their step and deportment so very free and active, that we could not but observe the striking difference which exists between them and all the various tribes we had hitherto seen. They were mostly of an European stature, and the countenances of the younger individuals had an open and not unpleasing expression; still, the small eyes, short and widely-spread nose, the hollow and low forehead, betokened the type of the South American aborigines. Only the old ones were disfigured by holes in their lower lips and the cleft lobes of their ears. The former orifice was produced and enlarged by inserting shining yellow cylindrical pieces of alabaster or resin, from 1½ inches to 3 inches long, and which could be easily removed at pleasure; while in the slits of the ears, of which the lobes were unnaturally extended to a length of between 2 and 3 inches, they wore pieces of wood, reaching nearly to the shoulder. The prevailing hue of those indi-

viduals who appeared strong and well-nourished, was a shining bright copper-brown, just the same as we had seen in all Indians when in good health; for it is only by sickness, poor living, and seclusion from the open air, or mingling with Europeans, that this original hue of the native Americans is ever changed to a paler tinge. There was not a tattooed face among all the individuals present, nor do I think this disfiguring custom prevails among any of the tribes in the Province of Maranhão. But the whole horde having been invited to dance at night, they appeared painted black and red on the upper part of the body, their countenances distorted with the wildest bacchanalian frenzy, and their long raven hair hanging loosely about their necks. One of them summoned the rest to the dance by blowing a large cane-trumpet, called a *boré,* which gave a rattling sound, and was echoed by the terrific howls of another individual, and finally responded to by the yells of the entire horde, alarming the peaceful town, and startling whole swarms of bats from their slumbers in the roofs of the houses. The irregular bounds and contortions, the martial brandishing of the arms and weapons, with the hideous countenances of this unbridled rabble, accompanied by their discordant, monotonous howl, and the sound of their rattle-boxes, called *maraca,* might well convey an idea of Pandemonium. Most of them had worn short breeches of cotton cloth, which some of them exchanged, during the dance, for a kind of belt, such as is commonly worn by the Indians of the northern parts of Brazil. The few women who accompanied the party were decently clad, and took no part in the dance; but were occupied in receiving the little gifts which were tendered to them by the spectators.

The language of the *Aponegi-crans* and that of the *Carumés,* which we ascertained by examining individuals from both tribes, appeared the same, abounding in guttural sounds, sharp accents, and accompanied by many and significant contortions of the features. The identity of the two hordes, now composing

but one tribe, was further proved by the similarity of manners and the friendly terms on which they stood with each other; and is confirmed by the report of some Brazilian friends, who possess much accurate knowledge of the different Indian nations.

Notes on the VEGETATION *and general character of the* MISSOURI *and* OREGON TERRITORIES, *made during a Botanical Journey in the State of Missouri, and across the South Pass of the* ROCKY MOUNTAINS, *to the Pacific, during the years* 1843 *and* 1844; *by* CHARLES A. GEYER.

(*Continued from p.* 310, *of this Vol.*)

III.—*Sub-division: rocky, sandy, or loamy ridges, and river côtes*, ranging chiefly along the banks of rivers, from the Skitovo lake to the saline sandy desert at the United Lewis river.

With the first appearance of *Philadelphus Lewisii?* 559, somewhere about the limit of the Salesh-Flathead country, the sides of rivers become more and more bare, until they reach the Columbia, where, for a short distance, vegetation once more assumes its usual vigour, soon to leave the banks unclothed again, except some low shrubs, for a distance of about 600 miles. A few shrubs and plants follow this igneous formation into almost every recess; amongst them is the *Philadelphus*, at first very seldom met with, but becoming more plentiful, and at last very abundant, downwards. Near the junction of Clark and Columbia rivers, it grows mixed with *Rhus glabrum?* and *Ribes* (399), three shrubs which are seen together throughout the whole sterile region, with their herbaceous attendants, *Eriogonum* (425), and *Heuchera cylindracea?* At Fort Colville these plants are mingled with *Juniperus Andina*, Nutt. (Juniper, 592), a frutescent *Pentstemon* and *P.* 582, with which I found the only specimen of *Hedyotis*

(460); in the valley, *Corylus* and *Sambucus** appear with *Clematis* (617), *Rosa*, and *Symphoricarpus;* while the sterile places of the valley bear the spring plants of the Green Mountain region abundantly. Passing over the sandy woods and grassy plains, we come to the upper Koos-Kooskee, on whose trap-bound sides we notice again the former leading plants, along with many others. Here reappears, for the first time, the *Celtis*, since we saw it on the south fork of Platte; it is probably *Celtis crassifolia*, Pursh, and forms low, scrubby trees; the berries are gathered by the Indians for food. The shrubby *Acer* and *Hawthorn* compose with *Rhus* and *Ribes*, thickets, which harbor another species of *Rhus* (560.) Another *Ribes* (393) grows here, 15 feet high, with trunks 4 inches in diameter. Looking from the crested côte over the herbose plains, with the parrot-coloured *Castilleias* and large-flowering *Phlox*, we see a great contrast, as compared with the arid rocky ridge along the river and below in the valley. Blue, purple, and orange alternate or appear mixed confusedly together, each colour, however, prevailing one after the other. First, *Brodiea grandiflora*, then *Clarkia pulchella*, and last *Collomia elegans*. To this general character may be added the more or less showy hues of the following plants, growing in or around the sides of the valley: *Eriogonum* (425) with white, straw, and sulphur-yellow flowers; *Eriogonum* (396) showing afar its cream-white flowers in dense masses, accompanied by the former species; and the same hues are observable if one looks upwards from the valley to the precipices, where these *Eriogona* form elegant garlands on the narrow parapets. *Mimulus* (347), I found adorning a

* This species of *Sambucus* is very common in Lower Oregon, and is particularly characterized by its compressed annual shoots and lead-coloured berries. The latter have a far more agreeable taste than our elderberries, and I used to eat them raw daily, by handfuls, without any unpleasant effects. I have succeeded in raising several plants of this fine tree, so that it will not be lost to the gardens, where I consider it may prove a great acquisition.

rivulet on the high côte. *Blepharipappus?* (346), *Bartonia* (663), *Biscutella* (343), and *Hydrophyllum?* (613), grow scattered amongst *Allium* (226), *Euphorbia* (345 and 509), *Astragalus* (378). *Composita* (552), again clothed the precipices on the sunny sides, showing myriads of golden flowers out of its silvery-white foliage. At the foot of the côtes, in the valley, on sunny open belts, is the habitat of *Swertia* (352), *Erigeron* (392), and *Stenactis speciosa*, the *Calycadaniæ*, *Lupinus* (390), with racemes more than a foot long, and the showy *Pentstemon* (362), from 2 to 6 feet high. The steep lower parts of the côtes bear *Mahonia*, *Amelanchier*, a purple variety of *Peucedanum* (328), *Sedum* (373 and 504); and diverse transient *Boragineæ* abound, as the orange-coloured *Rochelia* (339 and 344, 348, 349). In a hot, sunny, stony plain, near the river, I saw the beautiful *Phlox* (340), with *Labiata* (468), *Caryophyllea* (466), *Cyperus* (510), *Pancium* (495), *Ferula*? (410), *Anthemidea* (350), *Scutellaria* 381, and *Nasturtium* (383). The thickets are composed of the common *Amentaceæ*, *Populus*, *Salix*, and *Alnus*; the *Cratægus* and *Cornus*, the large *Ribes*, *Roses*, and *Rhamnus*, with *Rhus*, cover densely a narrow valley close to the Koos-Kooskee. This thicket is interwoven with *Clematis*, *Vicia* (338), and abounds with flowers. Here, in the moist recesses, grow the tall *Sida* (410), *Hydrophyllum* (401), *Ranunculus* (400), *Turritis*? (353), *Scrophularia* (539), *Osmorrhiza* (367); and around the same, on the springy meadows, were collected *Compos.* (473), *Geum* (251), the *Gramineæ*, etc. (490, 497, 493, 494), *Geum* (251), and *Geranium* (402) in the borders of dry woods. *Mimulus* (474) I found in a muddy border of the rivulet.

Subalpine ravines harbor *Saxifraga* (363 and 966), *Collinsia* (354), *Saxifraga* (566), and *Cruciferæ* (564 and 565); the *Dodecatheon* and common spring flowers are likewise seen here.

The weeds in the fields are *Digitaria sanguinolenta* and *filiformis*, introduced from the Mississippi valley: *Erodium cicutarium* and *Anthemidea* (386), brought probably from

California; *Danthonia spicata, Hordeum pusillum* in waste places, with *Panicum capillare. Erigeron Canadense* does not thrive here, but *Camelina sativa* is rank in the wheat-fields. *Bromus* (244), though of a somewhat strange aspect, seems to be introduced also; the same may be said of *Verbena hastata* and *bracteosa*, with *Gnaphalium uliginosum*.

There is not so much variety in the côtes and ridges of the Spokan country. The characteristic plants and shrubs grow there, at well as *Clarkia* and *Collomia*, mixed with species of *Hosackia* (553), *Pyrrocoma* (588), the finely-branched and small-flowering *Epilobia* abundantly, but especially *Cynanchum* (449), *Asclepias* (235), *Onosmodium* (413), *Cantua* (435), and *Poterium* (467). *Kœlera* (537) occurs also. The foregoing grow more on exposed situations; close to the river is the habitat of the splendid *Bartonia lævicaulis*,*

* When I went for this *Bartonia*, I had a most singular adventure with rattlesnakes. I resolved to camp for the coming Sunday on a narrow enclosed prairie, between the sandy woods, the mountain, and the Spokan river, close to a rapid. After dismounting, I went to the river to drink, and found, on a small gravelly plain at the water's edge, some granite boulders lying scattered about, the whole spun over by *Marsilea*. Engaged in examining it, I was attacked by a large rattlesnake, which I despatched instantly, and thought no more of the circumstance, especially as some Indians came passing by, from whom I purchased an excellent dried salmon. As I had not had much to eat for the past week, I prepared a good supper of salmon, which I roasted on sticks by the fire. Meanwhile, I went to hobble my animals, and being alone, was engaged till dark. While taking my supper, I heard a noise; a mule, which I had tied up for the night, became exceedingly uneasy; but I did not leave my meal. After having done, I took up my tin cup to go to drink at the river, the moon shining bright. The noise seemed close to me, resembling the sound produced by dragging sticks over hard ground at a distance. As soon as I had traversed the small grassy prairie and stood at the bank, but 3 or 4 feet above the gravelly, stony water's edge, I, to my astonishment, beheld countless numbers of rattlesnakes, dashing and whirling on the gravelly space below. The moon shone clear, and I could distinctly see that they were crawling under and above each other, especially near the rounded granite boulders, which lay here and there. Around these they kept rattling incessantly, the greater number beating their rattles against the stones. The noise was increased by the

Diplopappus (141), shrubby *Labiatæ* and *Compositæ*, the latter lost to the collection by accident. On the coarse, gravelly margin of the river are masses of *Eryngium* (583), with *Calliopsis Atkinsoniana*, *Senecio* (575), and *Marsilea* (450), weaving itself

rustling of their scaly bodies on the gravel. The stench on the spot was very disgusting. Struck by fear, I retreated to my camp-fire, wrapped myself in my blanket, and watched, fearing these guests should take it in their heads to come to my fire, and find me asleep The noise continued till near ten o'clock, when it gradually but quickly subsided, and I went to sleep. As soon as daylight appeared, I got up, saddled my mule, and looked for my horses, in order to leave that unpleasant camp, but the horses were astray in the mountains, and I returned after a fruitless ride of nearly three hours, being compelled to remain. I now began to examine the spot by the water's edge, and found it deserted, just as quiet as on the afternoon before. The rattlesnake I had killed was lying there only. Not satisfied with that examination, I got a pole, and commenced lifting the large flat stones, thinking the creatures must be under them, but after all my searching, I could not see a single one. That no snake got bitten by another during the exciting dance, seemed to me very evident and remarkable, for it would have, by the length of the rendezvous, remained on the spot dead.

To tell marvellous tales of snakes and hunting-stories has been so common in America, that every one must be careful to relate a true adventure, lest he excites suspicion at the mere mentioning of what he is going to say, that it will be a hoax. But this custom has long reached the utmost pitch, particularly if we credit M. Violet's adventures, and to add more would be disgusting.

A few days after, I had the pleasure of seeing Chief-factor Macdonald at Fort Colville, to whom I was resolved, at all risks, to relate my snake-adventure. He had just returned with the Brigade, up the Columbia, from Fort Vancouver. When I mentioned the fact to him, and expressing doubt of his believing it, Mr. Macdonald moved his chair back, and showed some astonishment, stating, to my surprize, that he had had occasion to witness the very same thing at his camp, about Priest's Rapids, on the Columbia, about a day before me. I saw it on the evening of the 22nd of July, 1844.

Often had I heard of such assemblages of rattlesnakes, on the Upper Missouri, for example; but I always doubted the truth of it, till that evening. Possibly these reptiles congregate, before moving to their winter-quarters, under ground; but that would have been rather early, for I saw rattlesnakes above ground, fully six weeks afterwards The rocky banks of the rivers of Oregon are full of these reptiles.

over the moist sunny surface. *Cyperoidea* (455), with *Gratiola Missurica*, conclude this group. Near the *Bartonia*, but close to the water, I found the two *Compositæ* (452 and 453), forming large bushes; the former with fragrant foliage.

In small exsiccated ponds, surrounded by *Spiræa Douglassii*, *Alnus* and *Rhamnus*, I found *Polemonium* (530), with *Aster* (587 and 633), *Ranunculus* (580), *Delphinium* (420), *Carex* (573), and the surface covered with *Portulaca?* (531), almost decayed when I found it; adjoining are loamy plains, with *Chrysopsideæ*, *Artemisia* (668), *Trifolium* (678), but especially the elegant *Erigeron* (571); also meads of *Collomia*, *Clarkia*, &c. ascend to the mountain-spur, which we will visit to glance at the vegetation in the late summer months. Shrubs of *Spirea ariæfolia* and 558, grace the bare granite rock below and above, on sunny sides, with *Philadelphus*; *Clarkia* makes way for *Eucharidium* (658), though only in this locality (Tshimakain), and on the first pine-clad terrace grows the tall *Koelera* (527), with *Orchis* (534). Higher up the naked granite, grow patches of *Arbutus Uva ursi*, and the lignose suffrutescent *Pentstemon* (438). The cracks of the rock are filled with mould, and support strips of *Calochortus macrocarpus* and *Avena?* (189). The *Pines* are generally colossal, and some of them abound with the parasite *Arceuthobium* (577), so much as often to bend down the branches. Descending a little sideways from the mountain path, towards rivulets we find *Linnæa borealis*, *Pyrolæ* (427 and 428), *Viola* (602), and here also grows the singular one-flowered, two-leaved, liliaceous plant (No. 528), with a long, slender, creeping rhizoma I did not see the flower, but it was described to me as pale yellow. With it, but in deep, shady, dry, places, grows the *Composita* (523), with *Aspidium Filix fœmina*, *Rubus Nutkanus*, &c.

In the dry mountain woods I noticed a species of *Scorzonera*? (523), with a white, succulent, lactescent, fusiform tuber, eaten by the natives, and as good as an asparagus-shoot; the tuber renews itself every year, like that of a *Dahlia*. The large-headed *Troximon* (668), grows with it, and forms fields in

the lower woods and valleys. *Rubus Nutkanus*, and *Ribes* (426), including a tall *Streptopus*, *Thalictrum*, and *Smilacinæ*, inhabit rocky ground. Arrived at the highest crest of the plateau, we find the *Vaccinium* in fruit, and the low banks of the plains and woods robed in scarlet with the flowers of the pretty *Cantua* (435), not unlike our *Ipomopsis elegans*. Its scarlet colour is seen everywhere, if one steps out of the woods, losing itself in the distance, or behind a black-burned pine-trunk, appearing like fire; hence, the Canadian calls this flower, "fleur à feu," a translation of the Indian well-applied name. When riding through these masses, one discovers very many varieties in colour, from rose and pale pink (like our *Epacris*) to bright orange and scarlet, even deep blood-red. The white colour is here rarely met with.

The many exsiccated rocky basins are now filled with *Clintonia elegans*, *Trifolium* (472), the white *Brodiea* (437), the latter, however, in somewhat shady, rocky, loamy places, with *Trautvetteria grandis*, Nutt., which bears white flowers, much resembling the T. *palmata* in the Mississippi valley. These specimens were likewise lost, with several other more or less rare plants.

The recesses where in April the *Calypso* flourished, now exhibit *Chimaphila corymbosa* in flower, with *Goodyera* (595), and higher up, the *Pedicularis* (434), and groups of *Gnaphalium margaritaceum*. On open, though shady, moist places, but very widely scattered, appears now the parasite *Pterospora* (457) in flower, the whole plant consisting of a scape 1-3 feet high, scaly below, and from the middle ending in a slender raceme, with yellowish-brown flowers, resinous and viscid, like the stem and peduncles. This is a rare plant, but still more rare seems to be the *Epiphagus*? 445, of which I found only one specimen growing on the roots of an *Abies* in the same locality. A white *Trifolium* (659) characterizes the northerly slopes, blooming profusely even under the dense shrubbery of *Vaccinium* and *Myginda*.

We will now leave the further details of this chapter, and

place ourselves again on the Koos-Kooskee, to ascend the westerly côte, in order to examine the

III.—Sub-region of the level parts of Upper Oregon, and the high cold plains to the extreme left; elevation about 4,000 feet.

The Saptona, or Nez Percez, Indians, to whom this territory belongs, annually resort to these plains, not only to dig their *Gamass* and farinaceous roots, known by the name of "Nez Percez bread-root," but to graze their immense herds of horses and cattle. The country has several climates, along the Koos-Kooskee and Lewis river it is decidedly temperate; the grass remaining green during winter, and little or no snow lying on the ground. Above, on the highlands, however, frost is felt even in the midst of summer; and during the days (end of June, 1844) which I spent there, we had 2° to 4° Reaum. below freezing point, every night. Nevertheless, vegetation is luxuriant, even the tender flowers of *Cypripedium* stand the frosts well, and the pasture is excellent, as the thriving herds belonging to the Indians sufficiently prove.

These tesselated plains are separated by low, snowy, pine-clad mountain ridges, appearing to be spurs of the Blue Mountains, which finally, according to my informant, form a dividing ridge between the desert plains and the tributaries emptying directly into the Columbia, and those of Lewis river. The latter streams traverse the high plains, nearly parallel with the ridges, and are immersed in defiles, their almost perpendicular côtes being walled by rudely-torn, pseudo-columnar basalt, and remaining filled with ice for the whole summer months. Following these streams, the banks become steeper, and the basalt more regular, till, at the mouth of Salmon river,* it assumes the regular columnar form throughout.

* Here, but a few miles from the mouth of Salmon river, the Saptona Indians strike their summer camp, for the purposes of digging Gamass

If we ascend the walled terraces of the Koos-Kooskee, we find the rocks covered with *Bartonia parviflora*, *Calycadeniæ*,

and bread-root, and to get salmon, as well as to graze their herds of horses, numbering twenty-five thousand, and their cattle, of which they already possess considerable numbers. They leave these high, cold regions again at the approach of the winter, and retire with their herds to the temperate valleys, somewhat after the manner of the Swiss herdsmen.

The Gamass and bread-root digging is nearly finished when the first salmon is caught, and when the buffalo-hunters of the tribe set out for their distant hunting-grounds, on the waters of the Yellow-stone river, on the uppermost forks of the Missouri. Other parties equip themselves to meet the American emigrants to Oregon, and offer grain, horses, &c., in return for other necessaries, especially American cattle. A feast is generally given before all these parties separate; races and dancing are their chief pastimes, but the vulgar among them resort to ruinous gambling.

The Saptonas, or Nez Percez Indians, unlike their north-eastern neighbours, with whom they come in close connexion, lead generally an active, prudent life, under the surveillance of an American Missionary, belonging to the American Board of Foreign Missions, the Rev. Mr. Spalding, who resides at Lapwaï, on the Koos-Kooskee. The Saptonas are the only northerly tribe of Indians, to my knowledge, with whom the missionaries have so far succeeded as to render, in eight years' tuition only, the greater part of the tribe independent of hunting, by cultivating the soil, and rearing cattle and sheep. Scrupulously do they (the Saptonas) attend to their fields, and one may see them, at two o'clock in the morning, at work, that they may be able to go to school in the afternoon. The greater number read and write their own language well, and every one was eager to show me his hymn-book, copied by himself, nicely penned, and very clean. The women of this tribe distinguish themselves from their neighbours by cleanliness and rich dresses. I found several of them engaged in carpet-weaving and dyeing wool, under the superintendance of Mrs. Spalding. Mr. S. is by far the most successful Indian missionary deputed by the American Board of Foreign Missons. Undaunted by the haughtiness of his pupils, he overcomes all obstacles. He boldly left off the absurd custom of teaching the Indian to pray, before endeavouring to fill his hungry stomach; but persevered in making the poor creature understand that he must acquire property, to become independent of hunting, and that that property must be realized by rearing domestic animals and tilling the land. In the fall of 1844, several Indian families had raised that season two hundred bushels of fine wheat, from two to four hundred

Lygodesma, and *Polygonum* (335), growing round groups of *Peucedanum; Composita* (361) and *Troximon* (446), (but one plant in bloom), appearing abundant on the grassy border of the first terrace. On the plains near Peloose river, appears another species of the noble *Calochortus*, of which I could get no specimens, and only saw the large-winged fruit (C. *pterocarpus* of my Journal). Here also, and in fact almost throughout Upper Oregon, on grassy, moist slopes and in shady meadows, grows the *Umbellifera, Helosciadium*? 576,* the tubers of which are one of the dainty dishes of the

bushels of peas, and the same quantity of potatoes. Considering that such families own from one to three or four thousand horses, and twenty to thirty head of cattle, one may imagine that they are very rich, for the value of such property increases considerably by the present influx of emigrants. A grist-mill has been erected by Mr. S., on the mission premises, where the Indians get their corn ground; attached to it is a saw-mill, to cut timber for building houses; some of the chiefs were already at it, eager to exchange the tent for the house. By responding to the efforts of Mr. Spalding, and amassing property, it is unavoidable that the whole nation imbibes a degree of avarice, of which I justly accuse the Saptonas. Far from feeling grateful to the Mission and to their excellent teacher, they demand every thing gratuitously, and torment their instructor by that insolent haughtiness so peculiar to them. Mr. S., however, does not swerve an inch from his original plan, and operates now and then on their ambition, slowly but effectually. The American Board of Foreign Missions has committed an error in not aiding Mr. Spalding, or giving and entrusting to his hands the surveillance of all the Missions of that Board in Oregon. They leave him to struggle alone, and consequently the credit and praise belong solely to him.

The scientific reader will pardon this digression from my subject, for I have longed to do justice to Mr. S., and took advantage of this occasion. Those who have travelled in North America, and visited Indian Missions, will be, as I am, aware of their fruitless efforts to civilize the Indians, and of the immense sums squandered liberally by the American citizens for that laudable object. Here was the only place where I found the result propitious, beyond my expectation, and to make that rare case known to philanthropists, is the sole excuse I can offer for this deviation.

* This is probably *Helosciadium Californicum*, Dougl., an inconspicuous *Umbellifera*, perennial, with a black tuberous root. By boiling the tubers,

Saptonas, and truly a delicious root. Ascending another height, I found a group of *Pentstemon* bushes, No. 478, 2-3 ft. high, with above a hundred stalks, springing from a ligneous, thick rhizoma, each bearing a raceme of large pink-rose flowers. Still higher up, and almost on the plateau, appears another species of *Espeletia* (419), very abundant, and in place of *Esp. helianthoides.* The root of this species is less resinous than that of the others, and was formerly dug by the Indians and eaten. Above, on the pine-groved plateau, grow masses of *Galium septentrionale* and a species of *Asperula*, filling the small enclosed prairies. In the grassy pine-groves I found the *Viola* (407), and later again, in open moist prairies, *Œnothera* (496), *Epilob.* (518), and *Rumex* (488). On the brink of a mountain rivulet, fringed with colossal *Pines, Poplar*, and *Willows*, I gathered *Ribes* (507), a shrub about 6 feet high, with erect flowering racemes, smelling like *Prunus Padus.* I never met with it before nor afterwards, but was told by the Indians that it bears a brownish-red berry, of very agreeable taste. Many of the common plants of the Green Mountain defiles grow here, as *Epilobium latifol.* (229), and E. *coloratum, Carices, Mimulus*, &c.

The lower slope of the snowy pine-clad ridges teems with flowers of every hue; the pretty *Castilleias, Phlox, Pentstemon, Swertia*, and most of those mentioned in the Green Mountain excursion; besides several rare ones, in the collection. Amongst them is the elegant *Cypripedium*, very showy and abundant, growing in tufts, 1-3-flowered, of a

like potatoes, they burst open lengthwise, showing a snowy-white, farinaceous substance, which has a sweet, cream-like taste, and somewhat of the aroma of young parsley leaves. This plant, it seems to me, would be an excellent acquisition to our kitchen-gardens; for the purpose of introducing it, I gathered a great quantity of seeds, which are now in possession of Messrs. Lucombe, Pince, and Co., at Exeter, and who may possibly have raised plants. It holds in Oregon exactly that place which the wild carrot does with us; and I feel sure that the tubers would similarly increase in size by cultivation.

delicious fragrance, with a large white lip, streaked with yellow and purple. I found afterwards a single tuft of it, on a grassy mountain, near Spokan river. Other plants growing with it are *Gymnandra* (421), *Pedicularis* (422), *Lupinus* (423), *Peucedanum* (517), *Pentst.* (418), *Thaspium*? (414), *Erigeron* (502), *Fragaria* (612). The shady recesses of the woods abound with *Actæa* (520), 5-6 feet high, with white flowers and purple berries, *Pulmonaria* (458), *Aspidium*, (341), *Pyrola*, *Viola*, *Linnæa*, &c. Following these rivulets to their source in the plains, we come to a vegetation of *Gamass*, *Veratrum*, *Carices*, *Polygonum* (405), *Aira* (342), *Ranunculus*, and many other plants mentioned before. The moist plains are often stony, and are the habitat of the *Ferula* (220*), with *Espeletia* (419), groups of *Senecio* (484), and *Sida* (404), *Iris Missourensis*, *Alopecurus geniculatus*, *Beckmannia*, *Trichodium*, and others of common occurrence.

Leaving the main ridge of the Blue Mountains to our extreme left, we descend again, at the junction of the Koos-Kooskee and Lewis river, to the valley, which being stony, has a very rugged appearance. It is not so with the valleys of the small rivulets; they are generally spacious, fertile, and appropriated to agriculture by the Indians, mostly by means

* This plant grows also on the Platte river, in stony, moist meadows. It has an irregular tuber, much like celery, but with a many-headed rhizoma. The leaves and umbels, with all their parts, are upright, and appear as if folded up; only during flowering time these parts spread for a short time. For this reason, the Indians assert that two kinds of bread-root grow together, which are, in fact, one and the same plant. The roots, when dug, are washed clean, dried, and pounded to flour. To the bread, which they bake or rather smoke over their tent-fires, they give an oblong, rectangular form, about 3 feet long, 1 foot wide, and 3-4 inches in thickness, leaving a round hole in the middle, to fasten it on the pack-saddle. Such bread keeps nearly six months, if well baked. It is insipid, when it has not acquired a mouldy or smoky taste. It gets so hard when old, that it must be soaked in water for several hours before one is able to bite it; yet the Indians, who are accustomed to it from their childhood, like it much.

of drainage, for it is excessively hot in these valleys, their almost perpendicular basaltic côtes averaging 1,500 feet in height. Thickets of *Celtis* and *Cratægus* are also filled with *Rhus*, *Ribes*, *Spiræa*, and *Rose* bushes. The same is the case in the sterile valley of Lewis River, the ground densely covered with *Euphorbia*, *Erodium*, or *Thlaspi* (655), and the discoid *Cotula*. Lower down appear again the scarlet *Sida* (S. *obliqua*, Nutt.), joining the sub-fertile region and sandy desert, as in Missouri territory. Crossing the côte westward, we pass over a region of prairies, deeply furrowed with ravines. On this tract I observed sundry species of *Espeletia*, which I had not seen before; none, however, either in flower or fruit; their vegetation was over, but I could distinctly trace the form of their leaves.* At considerable distances I met with a few scattered plants of *Bartonia lævicaulis*, in full splendour. Soon we reach the valley of Upper Walla-Walla river, the territory of the haughty Cayuses, the handsomest Indians in Upper Oregon, nearly related to the Saptonas, whose language they have adopted, and with whom they make common cause in any undertaking. Following the Walla-Walla river, we soon arrive at Waïalitpu, the seat of the tribe, with an American Mission Station, a delightful tract, surrounded by the saline sandy desert, the main Blue Mountain ridge visible at the distance. This saline desert vegetation corresponds nearly with that on the east-side, but the soda is here not so copious. *Fremontia vermicularis* prevails again, higher and more robust, but decidedly the same shrub. Of other saline shrubs I found only *Iva axillaris*, with the annual *Atriplex argentea*. But there grew abundantly with *Fremontia* the *Purshia tridentata*, which is very large towards the Columbia river, where the drift-sand lies very deep. Here, with

* The leaves of the different species of *Espeletia* seem to take the form of some other *Compositæ*. Those of E. *helianth.* resemble *Doronicum*; those of E. 395, *Silph. terebinthaceum*; of 419, *Scolymus*; of the above, *Lactusa virosa* and others.

the former, grow *Artemisia tridentata,* the common frutescent *Chrysocoma* and *Rumex venosus;* the latter, as on the sands of Platte-river Valley, binds the sand with its long roots and those of a straggling suffrutescent *Psoralea* (P. *verrucosa,* Nutt.) A species of *Allionia* (651), as on the Platte, occurs also here, but prostrate, with *Cleome aurea,* from 1 to 4 feet high; *Ambrosia acanthocarpa*; and, above all abundant, the annoying *Opuntia fragilis.* The muddy willow-groves, near the mouth of the Walla-Walla river, exhibit vestiges of *Xanthium macrocarpon,* with *Polygonum Persicaria,* invested by a *Cuscuta,* 674, probably *Cuscuta polygonorum,* (Englm.); and on the desert basaltic plain above, I found the *Mamillaria,* mentioned in the remark to a former chapter.

I cannot attempt a description of the vegetation of Lower Oregon, owing to my rapid passage from Fort Walla-Walla to Fort Vancouver. The desert plains cease at the foot of the Cascade Mountains, a Blue Mountain spur separating Upper and Lower Oregon. Here the *Cupuliferæ* make their first appearance since we left the south fork of Platte river. The country, enclosing the Columbia torrent, is in parts a desolate wilderness, inhospitable even to the savage, whom I nowhere found more docile, and leading a more wretched life. Below this difficult mountain barrier, and about 140 miles from its mouth, the Columbia becomes suddenly placid, much resembling the Mississippi, only wanting the luxuriant forests of deciduous trees, which are rather mossy and poor. The pines, however, with which the country is over-stocked, are of great size, 120 feet being about the average height; some of them measuring 220 feet, and more, with a proportionate diameter of trunk.

Many interesting trees and shrubs I noticed on my rapid passage, but constant rain forbade the possibility of collecting specimens, and the reader must remain satisfied with the information which Mr. Douglas has given.

I arrived safely at Fort Vancouver with the Brigade of the Hon. Hudson's Bay Company, commanded by one of their

officers, Mr. Dugald Mactavish, who afforded me every facility with great readiness, and on landing, conducted me to the Governor and Chief-factor, J. Mac Laughlin, and J. Douglas, Esqrs. These gentlemen, with the hospitality and disinterestedness evinced by the whole corps of officers of that Hon. Company, invited me to take up my lodgings within the Fort, to prepare for the voyage to England, for which they gave me every assistance, of their own free accord, as well as at the desire of Sir W. D. Stewart, by whom I was liberally patronized throughout my whole journey. The vessel of the Hon. Company, the barque Columbia, Captain A. Duncan, left Fort Vancouver on the 13th of November, 1844, and arrived safely in London, viâ Sandwich Islands and Cape Horn, on the 25th of May, 1845.

I would express, in conclusion, my thanks to those friends, from whom I was unfortunately destined to part almost as soon as I had found them. Whether they be in the Mississippi valley, New England or Canada, Oregon, California, or the Sandwich Islands, I shall ever remember their kindness with gratitude. I cannot, however, so summarily express my feelings towards the Commander of the Columbia, and his officers generally. The many days and nights spent in that brave vessel, the constant kindness of Captain Alexander Duncan, his daring and his prudence, which saved the ship during the hurricane we experienced at the Falkland Islands, make his memory dear to me. I yet hear his commanding voice through the howlings of the storm, which drove the noble bark, all her sails double-reefed, at the rate of twelve knots an hour through the water, her masts bending like riding-whips. Yet no injury was sustained, but that of being driven out of our way, the danger being averted by his prudent measures. This hurricane took place on the morning of the 13th of March, 1845, a few days after we had rounded Cape Horn, with storm-sails set.

Finally, the writer takes leave of the learned and kind Editor of this Periodical, to whom, as well as to Sir Wm.

Stewart, of Scotland, he offers his hearty thanks for their assistance, and here closes these hasty notes on the Missouri and Oregon territories.

CHARLES A. GEYER.

Dresden, Kingdom of Saxony,
March 8, 1846.

(*The List of Mr. Geyer's plants will follow.*)

Notes made during a Continental Tour, in the summer and autumn of 1846, *being extracted from letters addressed to the Editor by a botanical friend.**

Copenhagen, July 2, 1846.

I landed at Hamburgh on Friday morning last, and remained there four days, enjoying the beauty of the town and its neighbouring gardens, but without seeing much in the way of botany. Dr. Lehmann, in the midst of various other occupations, has found time to finish, or nearly finish, the editing of *Plantæ Preissianæ*, of which the supplementary part is now printing; and besides him, some younger botanists have commenced publishing at Hamburgh, by contributing to the same work. The most active and promising is M. Sonder, a young man, one of the principal *Apothekers*, a class much superior to the generality of our apothecaries in point of general information. I had only the opportunity of seeing him for a few minutes; he appears very zealous, and is now occupied with Port Natal plants, of which he is publish-

* Other similar extracts, from former letters of the same distinguished botanist, written during former tours, and published in the Companion to the Botanical Magazine, vol. II. pp. 74 and 187, and Journal of Botany, p. 103, relate to Germany, France, and the Pyrenees. The present extracts will be found to refer to places much less frequently visited by the travelling naturalist.—ED.

ing a collection, containing many new things. He is also, I believe, to edit those of Zeyher, who is now at Hamburgh. His herbarium is already very considerable. Besides M. Sonder, Dr. Steetz, a physician, has worked up Preiss's *Compositæ*; and Dr. Gottsche is working specially at *Hepaticæ*, of which he is said to have a very large collection. There is, moreover, an octavo volume, just published by a Dr. Hübener, under the name of a *Flora of the Environs of Hamburgh*. The Botanical Garden is under the direction of M. Edward Otto (son of M. Otto, of Berlin), who collected for the Berlin Museum in Cuba and La Guayra. He is endeavouring to restore the garden from the low state into which it had fallen under his predecessor; but unfortunately, most of Preiss's plants, of which they ought to have so many, were lost before M. Otto came.

I slept at Kiel on Tuesday night, and yesterday morning paid my visit to the Professor of Botany, Dr. Notte, whom I had seen at the Hamburgh Meeting, in 1830. As far as botany is concerned, he is occupied almost exclusively with the Flora of his province, the duchy of Sleswig-Holstein, where he has found a few interesting, almost sub-alpine plants, not, as he believes, previously gathered in the flat parts of the North of Europe; and has been paying particular attention to natural hybrids, which he has ascertained to exist, and brought into his garden, belonging to *Stachys*, *Potentilla*, *Rumex*, *Hypericum*, &c., and never, to his knowledge, producing ripe seeds, either wild or in the garden.

July 5th.—The Professor of Botany here, Dr. Schouw, so well known for his labours on geographical botany, has been suffering much, for the last year and a half, from rheumatic fever. I found him up and writing, but he has not been able to do much of late, and it is to be feared that he is by no means convalescent. The adjunct Professor, Dr. Liebmann, who lectures for him, is a very active young man. He returned, between two and three years ago, from Mexico, with a collection of plants, which he estimates at ten thousand species, including mosses and lichens of which he has a great

many. I was to have spent the morning yesterday, in looking over portions of it, but he was suddenly taken ill, and unable to leave his bed. The two previous days he showed us over the gardens and natural history collections. In the Botanic Garden a new stove has been built, where are a great many of the plants he brought from Mexico, especially an extensive collection of *Cycadeæ*, including several new species. Dr Vahl, the son of the celebrated botanist, is now here, librarian of the Botanic Garden, having the charge of an extensive library of old botanical works, and a considerable herbarium, including that of his father. I have looked over the *Mimosas*, and found authentic specimens of most of his species, as well as of Thonning's, published by Schumacker. Amongst these, *Mimosa adiantifolia* is a *Zygia*, apparently distinct from either of those I previously knew. M. *adstringens* is an *Acacia*, of the series of *Gummiferæ*. M. *pentagona*, an *Acacia*, near the American A. *paniculata*; and M. *Guineensis* is *Calliandra Portoricensis*, which is probably cultivated there, as in several other parts of Africa and the Mediterranean region, for ornament. It is a great pity that the great mass of matter, (about thirty folio volumes), ready for his Enumeration, which Vahl left at his premature death, was never published. His descriptions are amongst the most accurate I know amongst descriptions of *species*, so much better than descriptions of *individuals*, which botanists, accurate in minutiæ, are so apt to give us. The present Dr. Vahl lived many years in Greenland, and was with the French expedition to Spitzbergen.

July 7th.—Dr. Liebmann being better, I was able, before starting, to glance at one or two of his bundles. For *Terebinthaceæ* and other trees with very large pinnate leaves that cannot be divided, he has some paper of very large dimensions; but in general, his specimens appear to be well selected, of a moderate size, with that attention to flower and fruit, when practicable, which might be expected from one who is a botanist, not a mere collector. In the few bundles I looked over, (as yet unsorted), I saw many species unknown to me, amongst them a beautiful shrub, apparently belonging

to the *Caprifoliaceæ,* which Booth, of Flottbeck, has flowered lately from Liebmann's seeds, and sent to Dr. Lindley, who will, I suppose, figure it in the Register, if, as it appears to me, it be quite new. Dr. Liebmann's collection of *Ferns, Grasses, Mosses,* and other *Cryptogamia,* he says, is very extensive; I only regret I have not had time even to look at them. Besides dried specimens, he has brought many in spirits of wine, and drawings made on the spot, of *Orchideæ* and other interesting plants; for example, an orchideous genus with one perfect stamen, like those of *Scitamineæ*; a new *Thonningia,* of which he has very detailed drawings of the male and female flowering plant, and of the fruit, a fleshy mass with naked seeds; a new genus allied to *Cytinus,* parasitic on the roots of the *Bamboo,* &c. If this collection really proves, when sorted and arranged, to be nearly so extensive as it is estimated at, it is certainly by far the finest collection ever brought from Mexico. Dr. Liebmann is not able yet to do much towards the publication of these plants; his lectures (two every day for four or five days in the week, an herborization on the Saturday, and more or less of lectures nearly all the year round), take up the greater part of his time. He has, however, got ready his *Palms* in the form of a Supplement to Martius, and had worked up his *Orchideæ,* when he saw Richard's Enumeration announced in the *Annales des Sciences Naturelles,* and is waiting to publish till Richard's work is out.

July 9th.—I send this off from Göttenburg, where we landed yesterday evening at eight, instead of the morning at seven, as we should have done had we had the perfect calm of the two days before, and enjoyed the beauties of the coast instead of beating up against a north-west gale for twenty-six hours in the "wilde Kattegat," as it is called in the "Rose of Tistelön," which we have just been reading.

Stockholm, July 23, 1846.

During three days that we remained at Göttenburg, I had no opportunity of seeing anything botanical, there being

neither University nor Botanical Garden, nor could I then hear of any botanist there; but I have since been informed that Mr. Areschoug, Lecturer at the High School of Göttenburg, is a most zealous investigator of *Algæ*, of which he has a considerable collection. I came here by the canal, which gave me several opportunities, whilst the steamer was passing through locks, of gathering some of the few plants common in Sweden, but either scarce or unknown with us. I arrived at Stockholm last Thursday, and early the next morning went on to Upsala. There I was fortunate enough to find both Professor Wahlenberg, who has the care of the Museum of Natural History and Botanic Garden, and Professor Fries, at home. Both received me with every civility and attention, and I spent as much time with one or the other as my short stay would admit of my devoting to botany. The Museum was founded after the younger Linnæus' death, when the loss to the country of Linnæus's herbarium, made the Government feel the want of a public establishment for the reception of national collections. The herbarium, placed in two spacious and well-lighted rooms, consists chiefly of Thunberg's herbarium, Afzelius' African herbarium, and Wahlenberg's private herbarium. Of these, Thunberg's is by far the most valuable; it is glued down on white paper, after the model of our English collections, but on smaller paper than the Banksian and yours; the species, in like manner, gathered in generic covers; the genera have been arranged by Wahlenberg, according to Sprengel. Besides the plants collected by Thunberg himself at the Cape, Japan, Ceylon, and in North Europe, it contains a considerable number of authentic specimens, from Swartz, Lamarck, and other botanists of his day. I looked through the *Leguminosæ* and a few others, with the intention of noting down the modern genera to which they should be referred, but I soon found that the ascertaining the identity of the specimens described in his *Flora Capensis*, would be a work of much more labour and time than I could bestow. His plants are indeed all named; but in many cases he had discovered the mistakes he had made, erased his

original names so as to render them quite illegible, and substituted others; so that unless some botanist of correct judgment, and well acquainted with Cape plants, were to come and bestow some months on going through his herbarium, the puzzles of the *Flora Capensis* must remain uncleared. The specimens are generally small, but with a few exceptions tolerably satisfactory and well preserved. Afzelius' Sierra Leone collection is a very fine one; one set is glued down, after the pattern of Thunberg's, and the remainder, often many duplicates, are loose in sheets of a larger size. The specimens are generally good, and many of them accompanied by fruits in a separate collection, but with references to the specimens.

The living collection in the Botanical Garden, though not kept in such good order as could be wished, is tolerably rich. The Russian species received through the Petersburg garden, flourish well here; other exotics are such as could be obtained through Booth, of Flottbeck, and some interesting plants are the descendants of those cultivated by Linnæus, and thus constitute the only authentic specimens of such as did not dry for his herbarium. We went with Professor Fries to see the house in which Linnæus lived, and the garden where he cultivated his "Hort. Upsal." plants, now no longer belonging to the family; but in which the buildings used by this great father of modern botany as greenhouses and lecture-room still exist, and a poplar-tree, known to be planted by his own hands, is shown with great reverence. Proud thongh we may be in England of possessing his collections, it is impossible to be at Upsala, where so much is associated with his name, to see the respect paid to his memory, and the value attached to the few manuscripts or other remembrances of him which they have been able to amass, without feeling that this is the place where his library and herbarium ought to be, and that if they had been here the botanical world would long since have known what information can or cannot be derived from the specimens preserved, and as a tribute to his extraordinary genius, such of his manuscripts as are really interest-

ing or curious (and they are not a few), would have been given to the public, instead of lying unknown in the attics of our Linnæan Society.

Professor Fries is devoting himself, with his usual zeal, to the investigation of the Scandinavian Flora (that of the Scandinavian Peninsula from Petersburg to the North Sea), and has been specially studying *Hieracium*, *Salix*, and *Carex*. The general result of his observations has lately appeared under the title of "*Summa Plantarum Scandinaviæ*," being an Enumeration of the Flora of the country, with geographical indications of each species and detailed characters for such as are not in Koch's Synopsis, or are differently characterized by Fries. It appears to be a useful work, more especially as a kind of resumé of the conclusions drawn by Fries from a long and careful study of many difficult species.

Returning here on Monday evening, my first care was to find out the botanists. Professor Wikström, who has the care of the herbarium of the Academy of Sciences, devoted himself to us with the greatest politeness, and did the honours of the Horticultural and Agricultural establishments as well as of the parks attached to the royal palaces, &c., in the neighbourhood of this town. He is chiefly occupied with the arrangement and determination of the herbarium of the Academy. This consists of Swartz's West Indian collection, and of a general herbarium of a mixed nature, containing some good things from French and English botanists, Swartz's contemporaries, and some modern collections of Swedish travellers, chiefly West Indian and Brazilian, with a number of Macalisberg (South African) plants from a brother of Professor Wahlberg. Swartz's specimens are good and satisfactory, and looking through the *Mimoseæ* of the general herbarium, it appeared to me a very fair collection, though far inferior in extent to the principal herbaria of England, France and Germany. Professor Wikström is most anxious to increase it, and spares no labour in making up parcels for exchange, but the Academy is unable to allow sufficient funds for the purchase of specimens; and whether from the diffi-

culty of communication or the want of time on the part of the generality of botanists for keeping up distant correspondence, he has experienced much disappointment in not receiving the expected acknowledgment from those to whom he has sent specimens.

I much regretted not having the opportunity of making acquaintance with Professor Wahlberg, who is absent on an excursion into Scania. The younger Agardh, now devoted to *Algæ*, resides at Lund, which did not come within our tour. Besides these individuals, I understand that Professor Blytt, in Christiana, has a good herbarium, and has well investigated the Norwegian Flora; and Dr. Hartmann, a medical man at Gevle (to the north of Upsala), has published an octavo Flora of Scandinavia, in the Swedish language, and a Compendium of the same, under the title of "Excursions Flora." Both these are according to the Linnæan system.

St. Petersburg, August 8, 1846.

We came here from Stockholm by the Finland steamer Storfürsten, which touches at Abo, Helsingfors and Revel. The only botanist I met with by the way was Professor Tengström, at Helsingfors, who lectures in the University there, and superintends the Botanical Garden, in which he lives. The situation is very pretty, and the collection of plants in the garden is good, much better than I should have expected to find; but there are neither working botanists nor herbarium or library of any extent, everything of that kind having been destroyed by the fire at Abo before the University was removed. St. Petersburg contains two great botanical collections, that of the Academy of Sciences and that of the Botanical Garden. The herbarium of the Academy of Sciences is under the direction of Dr. Carl Anton Meyer, and under him, Dr. Rupprecht, but without at present any assistance for the mechanical part of the business. It is contained in two large, and a small room, round which are arranged the cabinets with mahogany glazed doors—useful in enabling you to see where the genera are, without opening

the doors; but a luxury, the cost of which might have been better applied to the purchase of specimens, for which the Academy is very short of funds. The specimens are loose, in double sheets of paper of a large size, and arranged in the Natural Orders, the genera separated by thin sheets of pasteboard, the species under each genus being placed alphabetically; the whole loose on the shelves, not tied in bundles, a great advantage over the usual continental custom of having from one to a dozen strings to untie every time you would look at a specimen; but still, if the herbarium were to be frequently consulted, having the disadvantage of not preserving the specimens so well as we do by glueing them down. The collection is rich in Russian and in Brazilian plants, it contains all Chamisso's and a very complete set of Sieber's plants, and besides some of the usual Cape collections, a very good one made by Hesse, with a miscellaneous collection from other parts of the world, the whole in very good consulting order, the undetermined and doubtful plants being at the end of each natural order. Besides this general herbarium, there is Marschall von Bieberstein's Tauro-Caucasian herbarium, nearly complete with good specimens, and Trinius's *Gramineæ*, a most extensive series, remarkably rich in authentic specimens. Dr. Meyer, who lives at the Botanic Garden, and is intimate with Dr. Fischer, has not published anything since the Monograph of *Ephedra*, which appeared two or three months ago; he is now investigating the Roses allied to R. *cinnamomea.* Dr. Rupprecht has been at work on the Flora of Russia, and has completed the three last parts of the "Contributions to the Flora of Russia," containing a critical Enumeration of the plants of the Samoied territory, with several new species, some of them figured; of the Russian *Ferns*, of which some are new; and of the plants of the neighbourhood of St. Petersburg, with geographical and historical notes to each. His worldly position at the Academy is not satisfactory for a man of so much ability, and he appears anxious to go out on an expedition round the world.

The herbarium of the Botanic Garden, under the general direction of Dr. Fischer and of his assistants, Dr. Meyer and Avé-Lallemant, is under the especial care of Mr. Meinshausen, a young man who accompanied Schrenck into Soongaria; there appeared to be also one or two young men at work as assistants. The space allotted to it is small; the different collections it consists of are, as yet, separate, and all tied up in bundles, so that it is difficult to judge of its extent; but it must be considerable. It contains the herbarium of the late Dr. Mertens, of Bremen, left by him in very good order, containing about twenty-five thousand species, and especially rich in European plants; that of Schrader, of Göttingen, bulky, but of less value; that of Schumacher, of Copenhagen, containing, like other Danish herbaria, a great many of Rohr's Cayenne plants, Thonning's African ones, &c.; very rich sets of Turczaninow's, Sowitz's, and Schrenk's plants, and those of other Russian collectors, besides miscellaneous collections. The library is also very good. What both herbaria are chiefly deficient in, appear to be East Indian, South American (except Brazil and Guiana), and Antarctic plants. Dr. Fischer himself has been at work at *Astragali*, and has prepared for press a detailed Monograph of the section of the *Tragacantheæ*; and with Dr. Meyer, he is now publishing the first part of a folio work, under the title of "Jardin de Saint Pétersbourg," to contain coloured drawings and descriptions of interesting plants which have flowered here. This first part has a short account and drawing of the new Palm-house, in the state it had attained last season, and figures and descriptions of ten species, amongst which is a very handsome Brazilian *Almeidea*. Dr. Fischer possesses a private herbarium, arranged in large double sheets like that of the Academy of Sciences, and apparently containing a very considerable miscellaneous collection in good order.

I met here Professor Trautvetter, of Kieff, who is at work on the plants brought by Middendorf from Northern and Arctic Russia; and as there are but few aids at Kieff,

he came here to consult books and herbaria. The Flora gathered by Middendorf, is, in many respects, that of Melville Island, but more numerous in species. Professor Schychowsky and M. Avé-Lallemant are, unfortunately for me, absent; the former on a tour from Stockholm, by Borneo, round the Gulf of Finland, (he passed through Upsala a week before I was there), M. Lallemant in Germany. You will be sorry to hear that Turczaninow has been, for a considerable time, laid up with a severe accident. He had just moved to Taganrog, where he meant to settle, in order to be near two medical and botanical friends, but who both of them died about the time of Turczaninow's arrival; and he himself, a man of large size and heavy frame, whilst lifting a large package of plants, fell down stairs and sustained some severe internal injuries, which kept him for months prostrate on his bed, unable to do anything. He is now said to be getting better, and to meditate returning to his relatives at Perm—a long, cold, and painful journey for an invalid.

(*To be continued.*)

Notice of three new FUNGI *collected by* MR. GARDNER *in Ceylon; by the* REV. M. J. BERKELEY, M.A. F.L.S.

(*With two Plates*, TABS. XVII & XVIII).

In a valuable collection of drawings of *Fungi*, prepared by native artists, under the direction of Mr. Gardner, at Ceylon, amongst other objects of considerable interest, there are six *Fungi* belonging to the Phalloidal group. Some of these are so important, that, though the corresponding specimens are daily expected, it has been judged advisable at once to publish figures accompanied by specific characters, reserving all details for some future opportunity. The three which have been selected belong to genera, two of which, *Simblum*

and *Lysurus*,* are represented by a single species, and the other, *Aseroe*, by two or possibly three.

1. Simblum *gracile*, n. sp.; volva irregulariter circumscissa, parte superiore a receptaculo elevata; stipite gracili utrinque attenuato. (Tab. XVII. *f.* 1.) *Gardner, Ceyl.* n. 80.

The stem and receptacle, as in *Simblum periphragmoides* from Mauritius, are of a pale yellow. The species is distinguished by its more graceful habit, its slender, attenuated stem, and small receptacle, which, as it is protruded, lifts up with it a portion of the volva.

2. Lysurus *Gardneri*, n. sp.; volva obovata; stipite cylindrico albo sursum rugoso incrassato; ramis receptaculi quinque subæqualibus albis apice junctis. (Tab. XVII. *f.* 2.) *Gardn. Ceyl.* n. 62.

Differing materially from the Chinese species in colour, in the cylindrical stem, and other important points.

3. Aseroe *Zeylanica*, n. sp.; radiis receptaculi 20 rarissime furcatis pulcherrime cinnabarrinis; hymenio phæniceo-purpureo; stipite brevi obeso subæquali. (Tab. XVIII). *Gard. Ceyl.* n. 91.

This species resembles most *Aseroe pentactina*, Endlicher, which is, however, I believe, a mere form of A. *rubra*. It is distinguished from all by its mostly undivided rays, which bring it very near to *Calathiscus*, Mont. of which it has the habit.

Notes on the Botany of the Pyrenees, in a letter to the Editor, from Richard Spruce, Esq.

(*Continued from p.* 429.)

After a day spent at Argélez in putting the remainder of our Spanish plants into paper, we proceeded to Luz, which

* Corda has figured a splendid Fungus, in a plate at present unpublished, which he refers to *Lysurus*; but it is probably rather the type of a new genus, intermediate between *Lysurus* and *Aseroe*.

is at about the same distance as Cauterets, but less elevated. My souvenirs of Luz are not of the most agreeable kind, partly because they are always connected with the dirt and dust (to say nothing of the fleas) of Madame Cuzaux's hotel, though scarcely any guide-book fails to vaunt its excellence; and partly because I gathered fewer mosses there than in any other part of the Pyrenees. Indeed, the whole of the district, including the environs of Luz, Barèges, and Gavarnie, is almost destitute of mosses, which is easily explained by there being no forests. It produces, however, some excellent flowering-plants and lichens.

I wasted a whole day in searching the schistose rocks on the mountain called "la Butte St. Justin," to the left of the road leading to Barèges, where M. Desmoulins had discovered a new lichen, described by Dr. Montagne in the "Annales des Sciences Naturelles," under the name of *Endocarpon Moulinsii*. I gathered the curious *Endocarpon saxorum*, but of E. *Moulinsii*, so easily distinguished by its being the only species of the genus which has the thallus pubescent beneath, I saw not a trace; yet I was afterwards so fortunate as to find it on some rocks of similar character, at the base of the Château of Luz, where it grew accompanied by *Parmelia fulgens*.

On the 13th of August we set out on an excursion to Gavarnie, intending to pass the night at the village, and on the following day to explore the Col and Vallée d'Estaubé. I spent some time among the rocks called Chaos, between Gedre and Gavarnie, where I gathered some Cryptogamia, amongst which *Andreæa rupestris* and *Parmelia chlorophana* (*Squamaria electrina*, DC.), are worthy of mention; the former on account of the very great rarity of the genus *Andreæa* in the Pyrenees. I know of nothing in the climate or the physical character of the Pyrenees which will afford a reason for this curious fact: the almost total absence of the allied genus *Sphagnum* is accounted for by the want of turf-bogs, of which I have seen but two in the Pyrenees, and neither covered more than two or three acres of ground. The

only flowering-plant gathered before reaching Gavarnie was the beautiful *Merendera Bulbocodium,* Ramond, which covers the moist meadows there with its crocus-like flowers, as *Colchicum autumnale* does in some parts of England.

We secured beds at the auberge, and ate a substantial luncheon, after which we proceeded to explore the famous Cirque of Gavarnie. It cost us an hour's walking to reach the entrance to it, although from the immensity of its dimensions it had appeared close at hand, and the night was fast closing in when we passed the "Pont de Neige." On returning across it, after gathering fine specimens of *Geranium cinereum,* with which the ground was in some parts quite enamelled, *Aquilegia Pyrenaica,** *Ramondia Pyrenaica,* &c., there was just light enough left to prevent our stepping into one of the *crévasses,* and plunging into the furious Gave below, and we reached our hotel between darkness and the twilight of the rising moon. We rose the following morning at five, and after waiting a most unreasonable time for breakfast, at length set out with our guide to ascend to the Col d'Estaubé, which lies eastward of the Cirque. One of the principal objects of our search was *Ranunculus glacialis,* which had been indicated to us as growing near the Col; but we explored the "moraines" at the base of two glaciers without seeing it, and I can scarcely believe it exists there. We found several interesting plants which amply repaid us for missing this; such were *Saponaria cæspitosa, Arenaria purpurascens, Aronicum scorpioides, Gnaphalium leontopodium, Veronica Nummularia,* &c. The view from the Col is extremely grand. On the left, and westward from us, the whole mass of the Vignemale, rising to the height of 11,000 English feet, stood exposed to view; and nearer to us, on the same side, the ramparts and towers of Gavarnie, looking exactly like some gigantic Gothic castle—its portal, the famous *Brèche de Roland,* nearly on a level with the place

* I do not see how this is to be kept apart from A. *alpina,* for I find the spur always more or less curved at the extremity; and I consider it highly probable that both of them are merely alpine states of A. *vulgaris.*

where we stood, and its highest summit, *la Tour du Marboré*, ascending above the Vignemale, and but a few toises lower than Mont Perdu itself. In front were seen the Pimenée and the whole of the mountains around Cauterets, Luz, and Barèges. On our right, and on the opposite side of the Vallée d'Estaubé, which terminates there, was the Port d'Estaubé, through which Ramond passed to make his celebrated ascents of Mont Perdu. We had several glimpses of the snowy summit of this noble mountain in descending the Vallée d'Estaubé, which we traversed throughout its whole length, and passing over Mont Coumelie, descended at Gèdre, where we dined, and afterwards walked to Luz by moonlight. This was one of our hardest days in the Pyrenees, for we were on foot during fourteen hours, and travelled over much difficult ground. The plants gathered in this excursion, not mentioned above, are the following:

Cardamine bellidifolia.
Medicago suffruticosa.
Oxytropis campestris.
montana.
Saxifraga longifolia, *Lap.*
Lonicera Pyrenaica.
Asperula hirta.
Crepis pygmæa, *L.*
Soldanella alpina.
Salix retusa.
Juncus trifidus.
Festuca varia, *Hænke.*

To these may be added the chief of those gathered in the vicinity of Luz, viz.:

Chærophyllum aureum.
Tordylium maximum.
Crepis albida, *Vill.*
blattarioides.

Prenanthes purpurea.
Soyeria lapsanoides.
Phyteuma orbiculare.
Plantago Cynops.
Andropogon Ischæmum.
Eragrostis megastachya.
Setaria viridis.

We passed the night of the 19th at Barèges, whence we set out early the following morning, accompanied by a guide, to cross the Tourmalet, Dr. S. intending to return to his family at Luz, and myself to proceed to Bagnères-de-Bigorre the same evening. We had hoped to herborize on the Tourmalet, but were prevented by the dense fog which covered all the mountains. This changed into a drizzling rain when I descended to Grip, at the extremity of the Vallée de Campan, and continued so for the remaining nine miles of the journey, so that I entered Bagnères in no very enviable plight. I gathered, however, on my route, *Paronychia argentea* and *Daphne Cneorum*, besides a few mosses, of which *Bryum pallescens* and *Encalypta streptocarpa* in fruit are the most interesting. The latter I afterwards found to fructify abundantly on the walls and in calcareous soil in the woods about Bagnères.

I was addressed at Bagnères to M. Philippe, a very liberal and excellent dealer in objects of natural history, and to M. de Lugo, a learned and accomplished Spaniard, both ardently attached to botanical pursuits. The former was a domestic of the late Baron Cuvier, from whom he acquired a taste for, and some knowledge of natural history. Thirteen years ago he established himself in the centre of the Pyrenees as an *empailleur*, and in the course of a few years succeeded in amassing a considerable collection of the animals, birds, insects, and minerals of the Pyrenees, to which he afterwards joined the flowering-plants, and he is now completing his museum by the addition of the Cryptogamia. To any naturalist visiting

the Pyrenees, and wishing to make purchases of zoological, botanical, or geological specimens, I can confidently recommend those of M. Philippe as being excellent in quality and reasonable in price. During this visit to Bagnères, I made but one excursion worth mentioning; this was to the mountain called Lhieris, which is well known for its botanical riches. The season, however, was too far advanced on the 23rd of August, and many good plants were quite passed. The following were those collected:

Silene Saxifraga.
Epilobium Duriæi, *Gay*.
Laserpitium Siler.
Galium aristatum.
Valeriana Pyrenaica.
Aster alpinus.
Campanula Scheuchzeri.
longifolia, *Lap*.
Betonica Alopecurus.
Sideritis scordioides.

The 27th and 28th of the same month were occupied in walking through the mountains from Bagnères-de-Bigorre to Bagnères-de- Luchon, by the route of Arreau and the Port de Peyresourde, a distance of about forty miles. During this journey I gathered a few Cryptogamia, but no flowers. The latter were indeed not to be had now, except on the highest mountains; and when I arrived at Bagnères-de-Luchon, I began to fear that all chance was gone of adding further to my stock, for that very night a heavy fall of snow took place, and I was told that in the Port de Bénasque it lay to the depth of above a mètre. However, in two or three days afterwards, all trace of the recent fall had disappeared, and I was able to recommence my botanical operations.

Being now in the centre of the loftiest and most promising mountains in the Pyrenees, I determined to prolong my stay to the latest possible moment, and when I left on the 4th of

October, the diligences had ceased running, the hotels were deserted, and there was not a single *pensionnaire* remaining in Bagnères-de-Luchon. Before this period arrived, I explored every promising locality, extending my excursions beyond the frontier into both Arragon and Catalonia, and on the French side as far as Esquierry and the Lacs d'Oc. Some of my best mosses were gathered in the Vallée du Lys, and on the lofty mountain of Crabioules, which terminates it on the west; they include *Bryum elongatum* in several forms, *Cephalogonium longirostre, Dicranum denticulatum, flavellum, longifolium* and *Sauteri, Fissidens osmundioides, Trichostomum tortile, Anæctangium compactum* (in fruit), magnificent specimens of *Hypnum Crista-castrensis, reflexum, salebrosum* and *umbratum, Isothecium cladorhizans, Anacamptodon splachnoides, Jungermannia julacea, Madotheca platyphylloidea,* Schwein., &c. The Vallée de Burbe, which conducts to the Spanish village of Bossost, through the Port de Portillon, is also rich. Here I gathered *Dicranum curvatum,* Hedw., and the rare D. *fulvum,* Hook. Musc. Exot., besides *Mnium medium, Leskea rostrata, Leiochlæna lanceolata,* and several others. On the mountain called Superbagnères, which rises immediately from the back of the town, I found *Didymodon cylindricus, Ceratodon cylindricus, Bryum concinnatum,* MSS., and a very distinct new species of *Plagiochila* (Pl. Pyrenaica, *MSS.*) allied to Pl. *interrupta* and *porelloides,* Nees.

On the 3rd of September I investigated the gorge of Esquierry, called, with great propriety, "le Jardin des Pyrénées;" for in no other place that I have visited do rare and beautiful plants grow in such abundance and luxuriance. But it is impossible in the space of a single day, to explore it fully; and I was quite bewildered amongst the multitude of good things, not knowing which to take and which to leave, yet unable to gather all, notwithstanding that I had left Bagnères-de-Luchon by starlight, and instead of returning there the same evening, slept in a cabane, near Lac d'Espingo. There was no lack of Mosses, but I was too much occupied with flowers to pay them the requisite attention; I found, however, *Bryum acuminatum* and

polymorphum, *Desmatodon latifolius*, var. *glacialis*, and some others. The flowers gathered at Esquierry are:

Anemone alpina.
 narcissiflora.
Cardamine resedifolia.
Sisymbrium pinnatifidum.
Geum montanum.
Epilobium trigonum, *Schrank.*
Bupleurum Pyrenaicum.
Eryngium Bourgati.
Serratula cynaroides.
Gentiana nivalis.
Veronica alpina.
 bellidioides.
Euphrasia minima.
Pedicularis Pyrenaica, *Gay.*
Lilium Pyrenaicum.
 Martagon.
Luzula spadicea.

I quitted my rude lodging early next morning, thinking to visit with my guide the rest of the Lacs d'Oc, of which there are four besides the Lac d'Espingo, the last being the Lac Glacé, at the summit of the Port d'Oc; but when we reached the third lake, we were assailed with such a tempest of wind and rain, that we were obliged to retrace our steps. I made a second visit to the same locality on the 22nd of September, and gathered *Zygodon Mougeotii* in fruit, *Gymnostomum curvirostrum* and *rupestre*, *Bryum Zierii* and *longicollum*, Sw., with several other mosses.

I was joined by Dr. S. early in the month of September; and after much deliberation, we decided on ascending the Maladetta, as our last chance of obtaining *Ranunculus glacialis*. We set out then on the evening of the 10th, accompanied by a *marchand naturaliste*, of Bagnères, named Sarthe, and a boy who led the horse which carried our baggage, and

proceeded as far as the Hospice de Luchon, where we were to sleep. We found beds, certainly, such as they were, and no lack of society in them; but as to *sleeping*, that was quite out of the question, and we were glad to quit them at the first dawn of day. After a hasty breakfast, we started to ascend to the Port de Bénasque, which it took us three hours to reach. We gathered some interesting plants by the way, such as *Trifolium badium, Potentilla Pyrenaica, Saxifraga capitata*, Lap., *Gnaphalium supinum, Senecio Tournefortii*, &c., and in the Port itself, *Cerastium alpinum, γ. lanatum*, Koch, *Stellaria cerastoides*, and *Saxifraga bryoides.* From the Port de Bénasque, there is a descent of an hour to the base of the Maladetta, but we made the time much longer by searching the curious limestone rocks called Peña Blanca, on our route, where we gathered *Gaya Pyrenaica, Arenaria tetraquetra*, and *Saponaria cæspitosa.* It was nearly mid-day when we commenced the ascent of the Maladetta, and we were already fatigued; yet our toil was only just commencing. I have seen nothing more dreary and cheerless than the Maladetta, which really looks as if some *curse* had been pronounced upon it. Even where the grass does not refuse to grow, it is brown and withered, and seems to be never touched by the sheep, and the lichens on the rocks are rarely more than half-developed, exhibiting a rudimentary crust, but hardly ever any apothecia. Yet it is a grand and an awful mountain, with its bold peaks, immense masses of snow and ice, and foaming torrents, which lose themselves in horrid gulfs at its base. And even in a botanical point of view, there are oases in its deserts, which render it not uninteresting. In such we gathered *Silene ciliata, Cherleria sedoides, Alchemilla fissa, Saxifraga cæsia, Angelica Pyrenaica, Gentiana alpina, Carex frigida, nigra* and *Pyrenaica*, and *Phleum alpinum*; besides *Tortula aciphylla, Timmia Megapolitana* and *Weissia crispula.* We spent nearly an hour, after reaching the base of the great glacier, in searching the beds of the streams which are fed by it, for *Ranunculus glacialis*, and at length succeeded in finding a few specimens, but

they were nearly spoiled by the snow which had recently covered them.

We did not reach the Hôpital de Bénasque, where we were to pass the night, until dusk; and a more desolate, uninviting place for weary travellers like ourselves, cannot well be imagined. However, the prospect of a supper and a bed made us overlook the unglazed windows, the brigand-like figures, and the indescribable filth which everywhere met our eyes. The former, when it came, consisted of a soup of oil, garlic, and bread, of which a single taste was sufficient for me, though our guide ate of it with great relish, and a dish of boiled mutton cutlets, which I found so excellent as amply to compensate for the want of the soup. As to the beds, we were not without considerable misgivings as to the treatment we should meet with when we ventured to take possession of them; but after sitting over the fire we had caused to be lighted, as long as we could hold up our heads, we crept into them without taking off our clothes. Here we had not lain many minutes, when we were attacked by legions, equally numerous and voracious with those which Robinson Crusoe encountered in a part of the Pyrenees not very distant; and after bearing up against their assaults as well as I could until a little past midnight, I leaped out of bed and posted myself by the window, where I amused myself with watching the moon sink behind the opposite mountains. It was too cold to remain here long; but the idea of facing my tormentors again was so horrible, that I felt I had rather join the fifteen Spaniards, who lay round the immense hearth-fire below; and observing a spark still remained on our own hearth, I blew at it until I succeeded in raising a flame; and having made as good a fire as I could, my companion, who was suffering no less than myself, left his couch and joined me. Our first care was to exchange the garments we had on for others, which were in our carpet-bags, and we then passed most of the rest of the night in the interesting occupation of examining the cast-off property, and dislodging from it all the tenants we could lay hands on.

After this digression to entomology, I must return to the botanical portion of my narrative, and state that we quitted our chamber as soon as external objects were distinctly visible, in order to gather a remarkable thistle (*Cirsium glabrum*, DC.), which we had observed by a rivulet close to the inn, on entering it the previous evening; and then, after taking our chocolate, we set out to return to Bagnères. The fatigues of the previous day and the want of sleep, had very much unfitted us for travelling, and we found the ascent to the Port almost as difficult as that of the Maladetta. We gathered *Campanula pusilla*, some *Hieracia*, &c.; and I found mosses and lichens about the Port itself, sufficient to occupy me above an hour. They included *Mielichoferia nitida*, *Grimmia conferta* and *Sauteri*, *Gymnomitrium concinnatum*, and a *Hypnum*, which is quite unknown to me. We afterwards reached Bagnères-de-Luchon without meeting with any adventure, or gathering any plant worth mentioning.

On the 4th of October I returned to Bagnères-de-Bigorre, and as the weather rather improved after my arrival, I was still able to take long excursions into the mountains; and in company with Dr. S. and M. Philippe, gathered several interesting Cryptogamia. We were, in particular, well repaid for a visit to Lac Lehou (sometimes called Lac Bleu), at the extremity of the Vallée de Lesponne, made chiefly in quest of lichens. We gathered *Parmelia chrysoleuca*, and *Lecidea Wahlenbergii*, two of the most beautiful plants of the tribe, on a ridge of schistose rock close by the lake; besides *Parmelia ænea* and *chlorophana*, *Lecidea badia*, *Morio* and *contigua* (the var. called L. *umbilicata* by Ramond), *Biatora olivacea* and *Tabacina*, *Cetraria nivalis* and *juniperina*, *Sticta crocata*, &c. In the same place grew *Grimmia nigrita*, *Hypnum moniliforme* and some other rare mosses. The following are also some of the more interesting rock-lichens, gathered on Lhieris, Bédat, and other of the limestone mountains around Bagnères; viz. *Parmelia cervina*, *chalybæa* and *crassa*; *Lecidea albo-cærulescens* and *macrocarpa*; *Biatora decipiens* and *vernalis*; *Gyalecta cupularis* and *exanthematica*; *Verru-*

caria conoidea, *Dufourei* and *purpurascens*, and *Opegrapha cerebrina*, Ram. Among the mosses gathered at Bagnères at this season are *Anomodon striatus* (Pterogonium, *Auct.*), which was in excellent fruit on the stems and branches of hasels and other shrubs on Lhieris, *Isothecium repens*, *Tortula paludosa*, *Racomitrium Sudeticum*, *fasciculare* and *protensum*, *Cinclidotus aquaticus*, and several *Hypna*.

I was so well pleased with Bagnères, that I determined to take up my winter quarters there, when I had made excursions to Pau and Dax, and, if practicable, paid a second visit to Gaston-Sacaze. The execution of these projects occupied me about a month, and the weather was happily sufficiently open to allow me to spend ten days at Laruns, from whence I made several excursions with Gaston, and added largely to my collection. In the environs of Pau I gathered fruit of several mosses I had observed in spring. My journey to Dax was unfortunately in very rainy weather; but I saw enough of its Cryptogamic botany to convince me that it was very rich, and deserving of a more extensive examination. The occurrence of many of the species which are found in the south-west of Ireland, is deserving of mention, though it was not unexpected. *Entosthodon Templetoni*, *Bryum Tozeri*, *Saccogyna viticulosa*, and *Mastigobryum trilobatum*, grew together, as I have seen them in Kerry. In this excursion I gathered several tree-lichens.

I arrived at Bagnères, for the third and last time, early in the month of December, and immediately set to work to arrange and examine my Phanerogamic collection, which occupied me during the whole of my stay, with the exception of the short excursions I made with my friends, Philippe and De Lugo, whenever the weather permitted. The weather was very severe in the early part of winter, and the snow lay on the hills down to the town of Bagnères itself; but in the beginning of January it became much milder, and the snow gradually receded, so as to leave the mountains exposed to a considerable height. I was consequently enabled to do a good deal of field-work, and was perhaps the first botanist

who had herborized the Pyrenees in winter. The following are some of the mosses gathered: *Coscinodon pulvinatus*, *Grimmia crinita*, *curvula*, *obtusa* and *orbicularis*, *Dicranum curvatum* and *rufescens*, *Orthotrichum obtusifolium* and *pumilum*, *Desmatodon nervosus*, *Trichostomum tophaceum*, *Tortula canescens*, *Polytrichum attenuatum*, and the following *Hypna* in fruit, viz. H. *catenulatum*, *crassinervium*, *cylindricum*, Bruch, *loreum*, *Schreberi*, *striatum*, MSS., and *Vaucheri* of Lesquereux. In calcareous soil, and on rocks of the same nature, I found in abundance the *Isothecium insidiosum* of Montagne (Entodon Montagnei, *C. Müll.*), and I felt sure, at the time, that I had observed it in similar situations in England. This I have confirmed since my return home, and I now find the plant in all the limestone quarries around Welburn. It has much the habit of *Hypnum Schreberi*, but is more rigid in its appearance, and the stem is not red as in that species. I added numerous *Hepaticæ* to my collection, but they have been scarcely looked at yet. One of them is a *Dumortiera* (*irrigua* or *hirsuta ?*), and I recognize *Pellia calycina*, *Jungermannia sphærocarpa*, *hyalina*, *polyanthos* var. *rivularis*, &c.; but by far the commonest *Jungerm.* near Bagnères, and indeed throughout the limestone districts of the Pyrenees, is what I take to be J. *Bantriensis*, Hook., in various forms, and it might therefore with greater propriety be called J. *Pyrenaica*. The localities around Bagnères which I found richest in mosses, are the valleys of Lesponne, Serris and Gazos, the Forest of Transoubât, the Woods of Gerde, Asté, and Pouzac, and the Gorge of the *Fontaine Sulfureuse* at Labassère.

On the 9th of March I bade adieu, not without regret, to the Pyrenees and to my friends at Bagnères, and proceeded to Pau, with the whole of my collections. The latter I sent off immediately by roulage to Paris, but I remained myself for a fortnight longer with my friend, Dr. S., and gathered during my stay several mosses, which had been too far advanced when I arrived the preceding year, such as *Tortula membranifolia*, *Gymnostomum tortile*, *Didymodon luridus*, &c.

In proceeding from Pau to Paris, I went out of my way to pay a last visit to Dr. Dufour, at St. Séver. Here I remained two days, and added the following interesting mosses to my collection, viz. *Tortula ambigua* and *cuneifolia*, *Funaria Muhlenbergii* and *Hibernica? Bryum Muelleri*, MSS. (Br. platyloma, *B.* & *S.* non *Schwgr.*), and finely-fruited specimens of *Trichostomum subulatum*, B. & S. I stayed ten days in Paris, and from thence taking the route of Dieppe, I finally landed at Brighton, on Good Friday, the 10th of April, along with the treasures I had amassed, the latter all safe and in excellent condition.

R. SPRUCE.

Annotationes in PIPERACEAS *Herbarii* ARNOTTIANI, *præsertim indicas a cel.* WIGHT *lectas, autore* F. A. GUIL. MIQUEL.

My dear Sir William,

By desire of Dr. Miquel, I send you for your Journal the following "Annotationes" upon some species of *Piperaceæ*, about which I wished to consult him. All Dr. Wight's collection are comprehended among them, except apparently one species, which Dr. Miquel has marked "*Piper Nepalense*," perhaps, however, inadvertently.

Yours faithfully,
G. WALKER ARNOTT.

Arlaay, Sept. 7, 1846.

PEPEROMIA, *Ruiz et Pav.*

Sectio Micropiper, *Miq.* Syst. Piperac.

1. Peperomia *Wightiana;* herbacea succulenta erecta basi radicans, foliis alternis vel summis oppositis petiolatis, inferioribus parvis rotundatis vel obovatis, reliquis ellipticis vel obovato-ellipticis, obtusis, basi acutis, glabris,

junioribus apice ciliolatis, uninerviis et obsolete venulosis pellucido-punctatis, subtus pallidis, amentis longiuscule pedunculatis axillaribus solitariis vel terminalibus subaggregatis filiformibus erectis remotifloris, baccis ovatis subobliquis.

In Malabaria, legit *Dr. Wight*, an. 1837.

Herba vix spithamea, ex affinitate *Pep. candidæ, Syst. Piperac.* p. 105, inde a basi ramosa, foliis inferioribus ½-1 cent. longis rotundatis vel plane obovatis, reliquis ellipticis vel obovato-ellipticis, basi acutis, apice obtusis vel rotundatis, quandoque subretusis, junioribus apice tenerrime ciliolatis, supra saturate viridibus, subtus pallidis, cum nervo medio percurrente parce venulosis vel venula utrinque e basi adscendente tenuiter trinerviis, 1-2 cent. longis, 8-15 mm. latis, *petiolis* ½-⅔ cent. longis. *Amenta* plerumque terminalia gemina vel terna, *pedunculis* 1½ cent. longis suffulta, filiformia, recta. *Bracteæ* et *genitalia* omnino congenerum.

2. Peperomia *Dindygulensis*, l. c. p. 122. Species in Peninsula Ind. Or. haud rara videtur, varias formas induens. *Minor forma* in *Herb. Wight.* nomine P. *blandæ*, aliæ sub P. *polystachyæ* titulo occurrunt. In *Courtallum*, Martio mense, 1835 (*Wight*). Inter eas etiam occurrit *forma* illa *luxurians alternifolia*, in *Syst. Pip.* p. 123 descripta, quæ olim fortassis propriam speciem sistere posset.

3. Peperomia *Courtallensis*; erecta succulenta glabra opposite vel alterne ramosa, foliis modice petiolatis oppositis vel summis verticillatis plerumque majoribus, omnibus magnitudine et forma dissimilibus, ellipticis, oblongis vel obovatis basi acutis vel attenuatis, apice rotundatis vel attenuato-obtusis aut emarginatis ibique junioribus ciliolatis, æquilateris vel inæquilateris, pellucido-punctatis, subtus pallidis, obsolete uninerviis et venulosis vel subtrinerviis, amentis axillaribus solitariis vel terminalibus solitariis vel aggregatis erectis strictiusculis longiuscule pedunculatis subdensifloris, baccis subimmersis oblique ovatis.

In *Courtallam*, legit *Dr. Wight*, an. 1836.

Præcedenti affinis; herba fere semipedalis, foliosa; *folia inferiora* 2-2½ cent. longa; *summa* pleraque fere elliptica, basi acuta, apice protracto, obtusa sæpe emarginata, 3-4 cent. longa, 1½-2 lata, in sicco membranacea, vix punctata. *Amenta* 3-5 cent. longa recta strictiuscula, *pedunculis* 1-2 cent. longis sustenta.

4. Peperomia *portulacoides, A. Dietr.—Miq. Syst.* p. 130. *Courtallam,* (*Dr. Wight*). Specimina hæc a Mauritianis nullo pacto diversa, nisi fortassis compage paullo crassiore.

5. Peperomia *Ceylanica;* herbacea pusilla erecta basi radicans di-vel trichotomo-ramosa, ramulis appresse pubescentibus, foliis oppositis vel verticillatis 3-4 nis, breviter petiolatis, adultis cum petiolis fere omnino glabris, ellipticis vel obovatis obtusis vel apice rotundatis, basi plerumque acutis, obsolete uninerviis et parce venulosis, nervo medio infra apicem in anastomoses dissoluto, amentis axillaribus et terminalibus, solitariis vel geminis, pedunculis subglabris, floribus densis, baccis ovatis.

In ins. Ceylon, legit *Walker*, an. 1837. (n. 1904).

A P. *Reinwardtiana* et P. *recurvata, Syst. Pip.* 141, differt foliorum forma, glabritie et florum situ.

Herba digito parum altior, basi inter muscos radicans, nuda, sursum magis ramosa et foliosa, *caule ramisque* pubescentibus cito glabrescentibus, *ramulis* appresse pubescentibus. *Folia infima* minima, *reliqua* diversæ magnitudinis, in sicco membranacea tenuia haud pellucido-punctata, supra atroviridia glabra, subtus pallida, nervulo medio ad apicem haud pertingente pertensa, venulis paucis obsoletis nascentia, versus basin puberula, ad apicem haud raro tenere ciliolata, *petiolis* antice canaliculatis ad lentem puberulis 1-2 mm. longis sustenta, *majora* elliptica vel obovata, 8-15 mm. longa, 8 circiter lata, alia multo minora plus minusve rotundata. *Pedunculi* tenere puberuli glabrescentes 1-5 mm. longi. *Amenta* teretia, superne aliquid incrassata in sicco nigricantia glabra recta vel leviter curvata, florentia 1-2 cent. longa, sub-

densiflora, *ovariis* leviter immersis, *bractea* pedicellato-peltata orbiculari, *staminibus* brevibus, *stigmate* penicillato terminali.

6. Peperomia *reflexa, Dietr.—Syst. Pip.* p. 169. Courtallam, Malabar, (*Wight*).

Chavica, *Miq.*

1. Chavica *Roxburghii*, p. 239; *fœm.* Salamcottah; *mas.* et *fœm.* Courtallam, (*Wight*).
2. Chavica *sarmentosa*, p. 242, Quilon, *fœm.* Malabar, *mas.* (*Wight*).
3. Chavica *sphærostachya*, p. 278, forma foliis quintuplinerviis minoribus. Courtallam (*Wight.*)—Forma normalis ibi etiam lecta est.

Cubeba, *Miq.*

Cubebæ *specimen masc.*, foliis coriaceis ovatis vel ellipticis acute acuminatis 5-7-plinerviis, nervis 3 mediis basi liberis, reliquis prope eam vel ex ipsa basi egressis, medio tantum ad apicem ducto, amentis filiformibus elongatis, floribus annulatim vel subfasciculatim dispositis, bracteis coriaceis basi adnatis obtusis concavo-patulis glabris, staminibus 2 circa pilorum brevium fasciculum dispositis.

Folia 8-14 cent. longa, 3½-6 lata, supra nervis impressis lineata, subtus iis prominentibus reticulata. *Amenta* 8-10 cent. longa, *pedunculis* 1 cent. long.

Malabar? (*Wight*).

Verisimiliter pertinet ad C. *Wallichii*, p. 289, cujus hucusque tantum, sp. fœm. vidi, quæ foliis basi cordatis differunt. Cum autem in hoc genere folia utriusque sexus plerumque forma et magnitudine differant, fallax adhuc manet judicium.

Piper, *Linn.*

1. Piper *nigrum, Linn. Syst. Pip.* p. 300. In Courtallam, Malabar, legit *Dr. Wight,* qui etiam testatur, ex hac specie baccas *Piperis nigr.* colligi.

Piper nigrum fœmineum, sylvestre? Foliis tantum paullo minoribus crassius reticulatis et staminum rudimentis prorsus deficientibus a P. *nigro* hermaphrodito differt. Baccæ paucæ tantum efformatæ, deficiente forsan polline; nec in usum œconomicum colligi videtur, cum tanquam *sylvestris* species in *Herb. Wight,* nomine P. *peepuloidis,* exstet. Courtallam, (*Wight*).

2. Piper *trioicum, Roxb.—Syst. Pip.* p. 310.

In Peninsula Ind. Or. legit *Dr. Wight.* Hæc sp. congruit omnino cum illa, quam teste specimine autographo? Herb. Lessert. pro specie Roxburghiana habeo. Folia autem ut in P. *nigro* subtus albicantia sunt. Si specimina a me pro specie Roxb. habitu revera ad eam pertinent, vix gravis inter P. *nigrum* et P. *trioicum* differentia existerit. Num Floræ Indicæ auctor meritissimus plures species sub hoc nomine confudit? Botanicos in India Or. degentes quam maxime rogatos vellem, ut his dubiis saluendis operam impendeant.

3. Piper *sylvestre, Lam.—Syst.* p. 314. *Fœmina.*

Courtallam, Martio, 1835, (*Wight*). A sp. masc. hucusque tantum a me observatis, quoad folia haud differt. *Bracteæ* oblongæ subtus hirtellæ. *Stigmata* 4 reflexa decidua.

4. Piper *Wightii*; foliis coriaceo-membranaceis subtilissime pellucido-punctatis supra glabris lævibus, subtus junioribus in nervis parce hirtellis cito glabratis, ovatis vel elliptico-ovatis brevi-acuminatis, basi leviter inæquali vel æquali rotundatis, septem (vel nervis 3 mediis paullo supra basin liberis), subseptuplinerviis, amentis fœmineis dein elongatis folium fere æquantibus patentibus, pedunculo petiolum superante, bracteis oblongo-linearibus submembranaceis subtus hirtellis, stigmatibus 3-4.

In Peninsula Ind. Or. legit *Dr. Wight.*

A P. *sylvestri*, cui foliorum forma accedit, distinguiter bracteis, a P. *attenuato* et P. *Nepalensi* foliorum forma et nervatione.

Ramuli flexuosi, teretes, striati, juveniles angulati læves glabri, internodiis 3-4 cent. longis, nodis constrictis. *Petioli* 1½-1 cent. longi antice canaliculati glabri. *Folia* 8-11 cent. longa, 5-7 lata, supra dilute viridia glabra lævia, subtus pallida, adulta glabra, juniora in nervis parce pilosula, minora basi subæquali rotundata, majora basi leviter inæquali subemarginata, subæquilatera, apicis acumine brevi obtusiusculo vel acuto, nervis septem, vel omnibus e basi, vel plerumque 3 mediis aliquatulum supra basin liberis, quorum medius ad apicem ductus, laterales fere ad eum perducti, reliquorum infimus brevis infra ⅓, sequens ad ½ alt. delitescens, omnibus utrinque prominulis, subtus anastomosibus parcis horizontalibus vix prominulis junctis. *Stipula* oppositifolia coriacea in sicco nigricans subglabra carinato-convoluta recurvata 3-4 mm. longa. *Pedunculi* 1½-2 cent. longi glabri recti vel arcuati. *Amenta* florentia 4-6 cent. longa, baccifera sæpe duplo longiora densiflora. *Bracteæ* oblongo-lineares in sicco fuscæ luteo-marginatæ submembranaceæ, subtus longe hirtæ longitudinaliter adnatæ. *Ovarium* ellipticum, *stigmatibus* 3-4, plerumque 3, lanceolatis deflexis puberulis. *Baccæ* ellipticæ subglobosæ 3-4 mm longæ, stigmatibus plerumque connatæ, pericarpio pulposo.—Folia quædam sub lente subtus argenteo-lepidotula. Specimini, quod in Negapatam in 1830, legit cel. Wight, hæc adscripsit: "An alpine plant, gathered on mountains near Dundygul, Dec. 1826, in flower and fruit, very abundant."

Forma etiam exstat foliis glabris fere quintuplinerviis, amentis bacciferis elongatis 13-17 cent. longis; quæ autem nequaquam separanda videtur. *Courtallum.*

5. Piper *lanatum, Wight, MSS. haud Roxb.* Ramulis, pedunculis, petiolis foliisque subtus hirtellis, his membranaceis pellucido-punctatis supra glabris, ellipticis vel sub-

ovato-ellipticis breviter acuminatis, basi leviter inæquali obtusis vel attenuatis, inæquilateris vel æquilateris, 5-pli- vel 7-plinerviis, nervis 3 mediis vel fere e basi vel remotius ab eo liberis, amentis dioicis elongatis, (pedunculo petiolum superante), masculis densifloris, floribus diandris, fœmineis sub-confertifloris, bracteis fere totis longitudinaliter adnatis subtus parce hirtellis, stigmatibus 3-4.

In Peninsula Ind. Or. legit *Dr. Wight*, in cujus Herbario cum præcedente speciæ sub nomine P. *trioici* et *lanati* exstat. Eadem species in collectione *Wallichiana*, sub No. 6642 G adest, olim a me inter dubias species P. *acri affines* relicta. Conf. *Syst. Piperae*. p. 324.

Præcedenti nec non P. *Hookeri*, Miq., et P. *Nepalensi* affine.

Rami glabri sub lente minute punctulati, *ramuli* hirtelli. *Petioli* pubescenti-hirtelli (pilis his et totius stirpis breviarticulatis) antice canaliculati 1-2 cent. longi. *Folia* membranacea vel coriaceo-membranacea, pellucido-punctata, supra glabra, subtus pilis crispulis hirtella, 7-13 cent. longa, 4-6 lata, anastomosibus parcis pertensa. *Stipula* oppositifolia lineari-convoluta hirtella 6 mm. longa. *Amenta fœminea pedunculis* 1½-2 cent. longis sensim glabratis sustenta, patula, recta vel flexuosa, 8-10 cent. longa. *Bracteæ* oblongæ subtus parce hirtellæ vel fere glabræ in sicco fuscæ et luteo-marginatæ. *Ovarium* ellipticum, *stigmatibus* 3-4 elliptico-lanceolatis reflexis albo-puberulis. *Baccæ* ellipticæ subangulatæ apice cicatrisatæ, 3-4 mm. longæ, denique fere glabosæ. *Amentum masc.* leviter curvatum, 17 cent. longum, bracteis ut in fl. fœmineo sed brevioribus. *Stamina* 2, *filamentis* crassis basi dilatatis, *antheris* globosis, loculis connectivo lateraliter adnatis.

6. Piper *hymenophyllum*; ramulis junioribus petiolis foliisque subtus in nervis crispulo-hirtellis, his tenuissime membranaceis præsertim junioribus transparentibus ellipticis attenuato-acuminatis acumine acuto vel obtusiusculo, basi acuta vel obtusiuscula subæqualibus, subæquilateris, quin-

tuplinerviis, nervis infimis tenuissimis, sequentibus fortioribus paullo supra basin liberis, per anastomoses vix ad apicem ductis, pedunculo petiolum duplo superante arcuatim patulo, amento fœmineo folio paullo breviore, bracteis lineari-oblongis longitudinaliter adnatis, undulatis, marginatis subtus crispulo-hirtellis, stigmatibus 3-4.

In Courtallum, legit *Dr. Wight.*

Rami crasse nodosi, internodiis 2-4 cent. longis, tenuiter striatis, junioribus compressis. *Petioli* 1-1½ cent. longi. *Folia* vix punctata 6-10 cent. longa, 3-4 infra medium lata, supra glabra. *Pedunculi* 2 cent. longi sensim glabrati. *Amenta fœminea* florentia 6-8 cent. longa, flexuosa.

Observ.—Primo adspectu species distinctissima, accuratius autem investigata, missa tenerrima illa foliorum compage, præcedenti specie proprius accedit, foliorum nervatione autem, bracteis majoribus iisque in sicco haud nigrescentibus speciei valorem sibi vindicat.

7. Piper *argyrophyllum, Syst.* 330. Sub nomine P. *Melamiris* in *Herb. Wightiano,* specimina exstant a *Wallichianis* olim a me descriptis parumper discrepantia. *Pedunculi* et *petioli* etenim ejusdem fere longitudines, imo hi subinde longiores. Courtallum.

8. Piper *trineuron* ; glabrum, foliis (summis) modice petiolatis elliptico-lanceolatis æquilateris breviter acuminatis, basi acutis, coriaceis, epunctatis, subtrinerviis, nervo medio crasso percurrente, lateralibus juxta margines adscendentibus tenuibus ad ½ alt. delitescentibus, venis pæne obsoletis, amento masc. breviter pedunculato parumper curvato, bracteis carnoso-coriaceis oblongis præter basin et apicem longitudinaliter adnatis, his elevatis subtus hirtellis, staminibus duobus.

Ceylon, legit *Walker* (No. 1784, in *Herb. Arnott.*)

Species certa, e specimine nimis fere incompleto descripta, cum solo P. *arenato* quodammodo comparanda, a quo autem foliorum nervatione statim dignoscitur.

Rami ramulique teretiusculi, nodis valde tumidis, interno-

diis 3-2 cent. longis. *Petioli* (summi) 6 mm. longi antice canaliculati. Folium summum 7 cent. longum fere 2½ latum, marginibus revolutum, apice acumine obtusiusculo, nervo medio subtus prominente et crassiusculo, lateralibus utrinque parum prominulis, venis horizontalibus parcis. *Pedunculus* 8 mm. longus tenuis; *amentum masc.* 4 cent. longum, vix 2 mm. crassum, in sicco nigrescens; alveoli floriferi parum hiantes sed prominuli.

MULDERA, *Miq.*

Hujus generis nulla hucusque species in Indiæ Orientalis continente detecta erat et cum in ditissima illa collectione *Wallichiana* nullam invenissem, illis regionibus genus hoc, duabus specibus Javanis compositum, plane deesse credidi. *Wightii* autem industria quatuor hujus generis speciebus Flora Anglo-Indico ditata est, quæ generis typo omnino conformes sunt et a Javanis stirpibus facili negotio discernendæ.

1. Muldera *trichostachya*; foliis superioribus lanceolatis vel oblongo-lanceolatis subæquilateris modice acuteque acuminatis, basi subæquali obtusiusculis vel acutis, quintuplinerviis coriaceis pellucido-punctatis, pedunculis sub-glabris petiolum vix æquantibus, amentis masculis elongatis patulis vel erectis, cyathisque oblique subglobosis basi constrictis puberulo-hirtellis, intus inter stamina hirtis.

Malabar (*Dr. Wight*, 1837.)

Frutex dichotome ramosus nodosus, *ramulis* lævibus tenuiter striatis. *Petioli* semiteretes antice canaliculati 1 cent. circiter longi. *Folia* coriacea utrinque glabra supra nitida nervisque prominulis pertensa, subtus in sicco subochracea ad lentem impresso-punctata nervis prominentibus notata, 9-12½ cent. longa, 3-3½ lata, marginibus leviter revoluta; e nervo medio crassiusculo percurrente ex ima basi utrinque nervulus oritur tenuis submarginalis ad ½ alt. delitescens et ad 1 cent. circiter distantiam a basi alter paullo

fortior adscendens et mox in anastomoses arcuatas excurrens; anastomoses parce prominulæ versus apicem arcus extrorsum convexas sistentes. *Pedunculi* leviter curvati plerumque versus apicem puberuli vix 1 cent. longi. *Amenta* (*masc.*) recta vel leviter curvata 6-12 cent. longa subconfertiflora sursum attenuata, *rachi cyathisque* hirtello-puberulis in sicco nigricantibus. *Cyathi* apice subantice rima transversa parva aperti, intus pilis longis instructi, intra quos *antheræ* vix emergunt.

2. Muldera *galeata*; foliis lato vel lanceolato-ellipticis modice acuteque acuminatis, basi leviter inæquali obtusis vel acutiusculis, septupli- vel summis quintuplinerviis, nervis tribus mediis paullo supra basin liberis ad apicem ductis, subcoriaceis rigidiusculis, pellucido-punctulatis, amento fœmineo longe pedunculato folio breviori glabro remotifloro, cyathi oblique clavati labio exteriore galeato, interiore minore, ovario depresso-globoso, stigmatibus 3-4 parvis.

In Peninsula Ind. Or. legit *Dr. Wight.*

Ramuli striulati flexuosi juniores compressi. *Petioli* (superiores) 2-1½ cent. longi teretiusculi antice canaliculati nascentes æque ac ramuli vix omnino glabri sed quandoque pilis microscopicis inspersi. *Folia* supra nitida nervisque pertensa, subtus ad lentem impresso-punctata, pellucido-punctata, marginibus leviter revoluta, 15-11 cent. longa, 4½-7 lata, nervis subtus prominentibus, infimo tenuissimo marginali et sequenti utrinque fere e basi exortis, tertio ad 1 cent. distantiam orto cum medio ad apicem ducto, anastomosibus transversis prominulis reticulatis. *Amenta* in sicco nigricantia, *pedunculis* 2 cent. longis sustenta, remotiflora, juniora 4 cent. longa.

Ejusdem *varietas* videtur specimen foliis subovatis obtusatis vel brevi-acuminatis 7-pli-vel 9-plinerviis insigne, alioquin autem plane conforme.

3. Muldera *Wightiana*; foliis ovatis vel ovato-ellipticis oblique acuteque acuminatis, basi subæquali rotundatis vel leviter emarginatis septuplinerviis, nervis 3 mediis ad

apicem continuatis (subtus rubentibus) membranaceo-coriaceis pellucido-punctatis, amentis (masc.) longe pedunculatis filiformibus elongatis folium superantibus patulis vel reflexis dissitifloris, cyathis reflexis clavato-galeatis infra apicem rima transversa antice apertis intus hirtellis.

In Courtallum, legit *Dr. Wight*, anno 1835. Haud longe distat a M. *recurva*, foliis autem summis haud lanceolatis et cyathi forma facile distingui potest.

Rami teretes striati, *ramuli* compressi. *Petioli* 1-1½ cent. longi. *Folia* 7-10 cent. longa, 4-5 lata, subæquilatera, apice incurva, marginibus leviter revoluta, subtus ad lentem albido-punctata; nervi infimi e basi in anastomoses marginales cito dissoluti; quandoque adhuc ad imam basin nervulus accessorius tenuissimus accedit; summi ad ½-1 cent. distantiam liberi cum nervo medio percurrente per anastomoses ad apicem continuati, in sicco leviter rubentes; anastomoses transversæ haud crebræ sed prominulæ et reticulatæ. *Pedunculi* 1½ cent. longi, nascentes haud prorsus glabri. *Amenta* nondum florentia 7-11 cent. longa filiformia plerumque flexuosa. *Stipulæ petiolares* fugaces parvæ lineares puberulæ et ciliolatæ. *Stipula oppositifolia* 1 cent. longa lanceolata carinato-convoluta recurvata basi vix omnino glabra.

Alia exstant *specimina*, amentorum et stipularum indole omnino conformia, sed foliis paullo recedentia, specifice tamen vix diversa. *Folia media* ovato-elliptica subseptuplinervia, *summa* lanceolata quintupli- vel septuplinervia æquilatera breviter acuminata, basi subæquali obtusa 10-12 cent. longa, 3-4 lata.

4. Muldera *multinervis;* foliis superioribus ovatis vel elliptico-ovatis breviter acuteque acuminatis subæquilateris basi subæquali rotundatis, septupli-vel subnovemplinerviis, nervo medio ad apicem, lateralibus duobus fere ad eum perductis, membranaceo-coriaceis obsolete pellucido-punctatis utrinque glabris, amento fœmineo breviter pedunculato

folio duplo breviore glabro subconfertifloro, cyathis transverse fissis, labio exteriore concavato, baccis depressis, stigmatibus 3 coronatis.

Malabar, (*Dr. Wight*, 1837).

Præcedenti affinis. *Nodi* crassi; internodia teretia vel angulata substriata. *Petioli* 1-2 cent. longi antice canaliculati. *Folia* 12-14 cent. longa, 6½-7 lata parum inæquilatera, in acumen breve acutum subobliquum attenuata, marginibus parumper revoluta, utrinque lævia glabra, subtus pallidiora, ad lentem fortiorem punctata; e nervo medio paullo supra basin utrinque duo nervi exoriuntur, quorum inferior ad ½, sequens ultra ½ alt. adscendit; ad 1-2 cent. distantiam a basi utrinque adhuc nervus oritur, qui cum eodem lateris oppositi, cui plerumque haud oppositus est, aream lanceolatam includit, infra apicem finitus; anastomoses transversæ parum prominulæ. *Amenta pedunculo* ½ cent. longo sustenta, 6 cent. fere longa erecta glabra. *Cyathi* aperti bilabi, *labio exteriore* concavo, *interiore* planiusculo obtuso; *baccæ* depresso-globosæ iis *Piperis nigri* similes, *stigmatibus* 3 lanceolatis recurvis puberulis coronatæ.

Artanthe, *Miq.*

1. Artanthe *tuberculata*, *Syst. Pip.* p. 497.

Banks of the river Guayaquil, (*Jameson*).

Ottonia, *Spr.*

1. Ottonia *diversifolia*, *Kunth.—Syst. Pip.* 538.

Rio, (*Scouler*).

Ejusdem forma grandifolia, foliis 12-15 cent. longis, 5½-7 latis, inæquilateris, in medio latissimis, habitu peculiari insignis, sed nullo certo charactere distincto.—Cum præced.

Amstelædami, Junii, 1846.

Revue de la Famille des Simaroubées, *par* J. E. Planchon, *Docteur-ès-Sciences.*

La revue qui va suivre n'est que l'application des vues générales qu'une étude attentive des *Simaroubées,* m'a fait prendre des limites et des affinités de ce groupe. Si je me décide à faire paraître en premier lieu ce qui devrait plus naturellement suivre des considérations générales, je ne manquerai pas de publier ces dernières afin de justifier les changements et les additions que j'ai introduits ici sans autre explication que les caractères même des sections naturelles, et des genres en particulier. Je tâcherai également de présenter un tableau des affinités réciproques et de la distribution géographique des plantes dont on ne trouve ici que des descriptions.

Simarubaceæ.

Simarubaceæ *auct.* Terebinthacearum, Zanthoxylearum, Ochnacearum, Polygalearum genera, *auct.*

Flores abortu diclines aut polygami, rarius hemaphroditi, regulares. Calyx 3-5 divisus. Petala totidem, divisuris calycinis alterna, æstivatione valvata v. valvato-involuta, non rarò imbricativa. Stamina numero petalorum v. dupla, sub margine v. inter lobos disci hypogyni inserta, filamentis intus basi squamula adnata appendiculatis, rarius nudis; antheris bilocularibus introrsis, in genere unico extrorsis. Ovaria 2-5, gynophoro plus minus evoluto insidentia, nunc libera, stylis apicalibus supra basim in unum confluentibus, nunc connata, stylis a basi concretis. Ovula in carpello v. loculo 1-2 rarissimi 4-5, secundum conformationem variam angulo interno varie affixa, si anatropa sub apice loculi, si amphitropa versus medium, si demum semi-anatropa supra basin, unde suspensa, v. peritropa v. ascendentia evadunt. Fructus e carpellis liberis v. connatis, drupaceus, nucamentaceus, rarises samaroideus v. capsularis. Carpella ex ovulo solitario v. abortu

sæpius monosperma, rarius 2-4 sperma. Semina integumento semper membranaceo, umbilico non carunculato, chalaza colorata sæpius lata. Albumen nullum, v. parcum, rarissime crassum, carnosum. Embryo in seminibus anatropis rectus, radicula versus micropylem, apice cotyledonum versus chalazam directo; in semi-anatropis rectus, apice cotyledonum a chalaza plus minus distante; in amphitropis hippocrepicus vel medio conduplicatus; cotyledones plano-convexæ, v. subfoliaceæ, rarissime contortuplicatæ v. conferruminatæ; radicula semper supera.

Suffrutices v. arbores excelsæ; foliis alternis exstipulatis abrupte v. impari-pinnatis, rarius bipinnatis v. simplicibus, foliolis non raro alternis, basi plus minus obliquis, integerrimis v. glanduloso-serratis, nunquam pellucido-punctatis, floribus sæpissime fasciculato-umbellatis, fasciculis in racemos, v. cymas divaricatas, vel paniculas digestis, rarius in axilla foliorum solitariis.

Sapor partium omnium plus minus intense amarus; pubes, um ad est simplex, rufescens v. albida; glandulæ foliorum marginales interdum pellucidæ, sed resinosæ, nec, ut in Zanthoxyleis, oleo volatili scatentes.

Tribus I. SIMARUBEÆ.

Simarubaceæ, *auct.*

Stamina numero petalorum dupla, filamentis intus squamula interdum minima auctis. Ovaria libera, uniovulata; embryo rectus.

Gen. I. QUASSIA, *DC. Ad. Juss.*

Quassiæ, *sp. L. et pl. auct.*

Flores hermaphroditi. Calyx parvus quinquepartitus. Petala calyce multo majora, membranacea, æstivatione contorta, sub anthesi non patentia. Stamina 10 exserta, squamula basilari brevi. Ovaria 5. Stylus (e quinque connatis) gracilis, longus, contortus, stigmate 5 lobo terminatus. Carpella 5, drupacea.

Arbor glaberrima, foliis alternis, impari-pinnatis, junioribus interdum unifoliatis, petiolo alato, foliolis oppositis oblongo obovatis, integerrimis, membranaceis; racemo terminali simplici v. ramoso, sæpius solitario; floribus coccineis majusculis, breviter pedicellatis.—Sp. unica quæ

Quassia *amara*, L. fil. DC. Prod 1, p. 733.

Per Americam tropicam late diffusa et frequentissime culta.

Surinam, *Dr. Hostmann*; Santa Martha, *Purdie*; Columbia, *Cuming*, n. 1136; ins. St. Vincent, *Rev. L. Guilding*; Jamaica, *Dr. Distan*; Demerara, *Parker*; Maranham, *Gardner*, n. 5982.

Obs. Genus inter affines consistentia partium membranacea insignis, ut *Triphasia* inter *Aurantieas*.

Gen. II. Samadera, *Gaertn. Ad. Juss. Mem. Rut.* p. 133, tab. 27, n. 46.

Flores hermaphroditi. Calyx brevis 4-partitus laciniis extus basi 1-2 glandulosis. Petala 4 (non raro 3-5) calice multo longiora, crassiuscula. Stamina 8-inclusa, squamula basilari brevi. Ovaria 4. Styli basi liberi mox in unum coaliti. Stigma acutum. Drupæ siccæ, plus minus compressæ, quaternæ vel sæpius abortu solitariæ.

Arbores v. arbusculæ, foliis simplicibus, breviter petiolatis, integerrimis, rigidis, eximie reticulato-venosis, subtus ad ortum nervi medii biglandulosis; pedunculis axillaribus vel terminalibus, strictis, longis, apice compresso subdilatatis, flores paucos, majusculos, flabellato-umbellatos gerentibus.

Sp. 1. Samadera *Indica*, Gaertn. fruct. II. tab. 156, fig. infera. Wight ill. of Ind. bot. tab. 68.

S. arborea, foliis ellipticis, pedunculo florifero folio subæquali vel longiore; fructu lenticulari compresso, circiter 2 poll. longo 1-½ lato, venis epicarpii sub epidermide lævi vix conspicuis.

Ind. or; Ceylon, *Col. Walker;* Insul. Malay.

2. Samadera *lucida*, Wall. pl. as. rar. vol. II. tab. 168.

S. arbuscula, foliis ellipticis, pedunculo florifero folio multo breviore, fructu lenticulari compresso, vix non pollicem

longo, superficie eximie nervoso-reticulata, pericarpio crassiusculo.

Indiæ Or. prov. Amherst, *Wall. cat. n.* 1062.

3. Samadera *Madagascariensis,* Ad. Juss. Mem. Rut. tab. 27, f. 46. *Niola,* Lamk. ill. tab. 299.

S. arbuscula, pedunculo foliis longiore, fructu compresso capsulæformi, pericarpio non crasso, (ex Ad. Juss.)

In insula Madagascar.

Species mihi ex iconibus tantum nota, præcedenti affinis, sed petalis multo brevioribus diversa. Samadera *glandulifera,* Presl. symb. bot. 1, tab. 51, (ex Walpers), est verisimiler S. *Indica.* Glandulæ ad basin folii in omnibus speciebus observantur.

Gen. III. Simaba, *Aubl. Juss. Kunth. A. S. H. Ad. Juss. Mem. Rut.* p. 132, tab. 27, n. 45.

Aruba, *Aubl.*—Zwingera, *Lehreb.*—Phyllostemma, *Neck.*—Quassiæ sp. *Rich.*

Flores hermaphroditi. Calyx parvus 4-5 divisus. Petala 4-5 longiora, patentia. Stamina 8-10 non exserta, squama staminum longa sæpe bifida. Ovaria 4-5 gynophoro insidentia, stylis basi liberis mox in unum coalitis, lobulis stigmaticis 4-5 terminatum. Carpella 4-5 drupacea, sæpe exsucca.

Arbores v. frutices Americæ tropicæ, foliis alternis, impari v. abrupte pinnatis, numero et situ foliolorum valde ludentibus, interdum unifoliolatis vel ternatis, foliolis integerrimis, coriaceis, glaberrimis v. pubentibus aut subvelutinis, sæpius glaucescentibus; flores non raro majusculi, pube vel tomento adpresso interdum sericeo vestiti, fasciculato-congesti, fasciculis nunc axillaribus, nunc racemosis, nunc in paniculam ramosissimam pyramidalem collectis.

Sp. 1. Simaba *Guyanensis,* Aub. Guy. 1. p. 400, tab. 153.

S. foliis impari-pinnatis, 1-3 jugis, foliolis oblongis utrinque acuminatis, apice emarginatis, fasciculis florum axillaribus (ex Aubl.); racemis axillaribus (ex DC. qui plantam vidit); floribus pro genere parvis.

Guyana, *Aubl.*

Specimina sub oculis habeo e variis locis Guyanæ, Surinamo, *Hostmann,* n. 144; Cayenna, *Mart.*; et ex Insula St. Vincentii, *Rev. L. Guilding,* forsan ad plantam Aubletii referenda, sed cum icone rudi et verisimiliter erronea non plane quadrantia: in illis fascicula florum in racemum axillarem simplicem v. basi ramosum extenduntur. Cæterum eadem specimina cum specie sequente exacte conveniunt, nisi folia in illis sunt semper impari, nec, ut in specie Kunthiana, abrupte pinnata.

2. Simaba *Orinocensis,* Kunth in H. et Bonpl. nov. gen. et sp. 6, p. 14, tab. 604 *a* et *b*.

S. foliis trifoliatis v. abrupte 2-3 jugis, foliolis oblongis, obtusis, racemis terminalibus, simplicibus vel ramosis.

In arenosis calidis, ad Orinocum, prope *Carachana, Humb.* et *Bonpl.*; an satis a præcedente diversa?

3. Simaba *multiflora,* Ad. Juss. Mem. Rut. tab. 27, n. 45 *a*. Præter analysim floris indescripta.

Guyana.

4. Simaba *subcymosa,* A. S. H. et Tul. in ann. des sc. nat. nouv. ser. vol. 17, p. 137.

S. foliis glaberrimis, imparipinnatis, foliolis ellipticis v. oblongo-ellipticis, apice obtusissimo rotundatis v. subcuspidatis; paniculæ foliis brevioris ramis cymosis.

In monte *Corcovado,* prope *Rio de Janeiro*. Sp. mihi ignota, ex auct affinis *Sim. suaveolente*.

5. Simaba *floribunda,* A. S. H. pl. rem. Bras. et Par. vol. 1, p. 126, tab. 10.

S. foliis imparipinnatis, foliolis lanceolato ellipticis, v. oblongis, obtusiusculis, glabris, panicula magna, composita. (A. S. H.)

Brasilia, in parte provinciæ *Minas Geraes,* quæ dicitur *Minas novas,* A. S. H.; *Minas Geraes,* Langsdorff in herb. Hook.

6. Simaba *suaveolens,* A. S. H. l. c. p. 128. tab. 11 A.

S. foliis abrupte pinnatis, superioribus trifoliatis aut simplicibus, foliolis ellipticis v. subrotundo-ellipticis, glabris, racemis compositis, (A. S. H.)

Brasilia. in provincia *Minas Geraes.*

7. Simaba *cuneata*, A. S. H. et Tul. l. c. p. 138. Simaba *lævis?* casaretto ex Walp. repert. bot. vol. 5, p. 398.

S. caule arboreo; ramulis glabris; foliis imparipinnatis, glaberrimis; foliolis obovato cuneatis, obtusissimis; panicula laxa foliis multo longiore.

Squamæ longiusculæ, lineares bifidæ; ovaria tomentoso-villosissima.

In maritimis prope, *Rio de Janeiro.*

8. Simaba *ferruginea*, A. S. H. pl. rem. Bras. et Par. 1, p. 127, et Flor. Bras. merid. 1, p. 72.

S. foliis imparipinnatis, foliolis ellipticis, pubescentibus, subtus nervosis, panicula composita, subsessili, folio breviore.

Brasilia, in provinciæ *Minas Geraes* parte deserta, *Certaó* dicta.

9. Simaba *glandulifera*, Gardn. in Hook. Lond. Jour. of Bot. 2 p. 169

Simaba *insignis*, A. S. H. et Tul. in ann. des sc. nat. nouv. ser. v. 17, p. 137. Simaba *longifolia*, Casaretto ex Walp. repertor. bot. 5, p. 397.

S. arbuscula; foliis maximis, abrupte pinnatis, foliolis angustis utrinque attenuatis, glandula terminatis; panicula magna composita rufo tomentosa.

Hab. in monte *Corcovado*, *Gardn.* n. 20, *Casaretto*; et in montibus *Sierra da Estrella* prope *Rio de Janeiro*, *Guillem.*

10. Simaba *trichilioides*, A. S. H. pl. rem. Bras. et Par. I, p. 129, tab. 2 B. e, Fl. Bras. mer. 1, p. 72.

S. frutescens; foliis impari-pinnatis, foliolis late ellipticis, obtusissimis, apice mucronulatis, supra pubescentibus, subtus subtomentosis v. glabris, floribus poll. et ultra longis, secus paniculæ subsimplicis ramos strictos fasciculato-congestis.

Sp. valde variabilis; sed, floribus longis extus adpresso rufo sericeis, squamisque staminum in tubum longum adproximatis facile cognoscenda; ludit petiolo communi foliolisque basi obtusis v. subcordatis, glabris vel utrinque rufo tomentosis, panicula subsimplici vel ramosa.

In campis occidentaibus provinciæ *Minas Geraes*, A. S. H., in provinciis *Piauhy* et *Pernambuco*, *Gardn.* n. 2515 et 2804; et in *Guyana*, *Schomburgk*, n. 955.

11. S. *Cedron*, sp. nov.

S. trunco simplici, erecto, gracili; foliis maximis, cum impari 20- et ultra-jugis foliolis angustis ellipticis, glandula apiculatis, glabris, supra livide virentibus, subtus pallidis, racemis longis, floribus, fere S. *trichilioidis*.

Arbor ob vires febrifugas celebris ad ripas fluminis Magdalenæ, prope pagum *San Paplo*, Novæ Granadæ, *Purdie*, in herb. Hook.

Gen. IV. Hannoa, Gen. nov.

Simabæ sp. dubia, Guill. et Perrot.

Flores diclines (an polygami?) *Masc.* Calyx primum clausus, subglobosus, mox in lacinias 5 plus minus subbilabiatim connatas ruptus. Petala 5 oblonga, æstivatione marginibus leviter imbricata. Stamina 10, exteriora 5 petalis opposita cæteris breviora. Filamenta subulata cum apice squamæ angustæ, ciliatæ, fere continua. Antheræ ovatæ, biloculares, medio dorso affixæ, oscillantes. Discus annuliformis, elevatus, ovarium mentiens, verticaliter 10-sulcum, basi gynophoro adnatum, apice pervio stylulos 5 exserens. Ovaria 5 verisimiliter effœta, libera, inter se approximata, disco subvelata. *Flor. fœm.* ignoti: drupæ 1-3, monospermæ.

Arbor erecta, 15-20 pedes alta, foliis alternis, cum impari 2-4 jugis, foliolis oppositis, oblongo-obovatis, apice rotundatis, mucrune latiusculo subcomplicato glanduloso terminatis, basi cuneata in petiolum longum attenuatis, margine integerrimo subundulatis, coriaceis, glauco viridibus; nervo medio utrinque prominulo, lateralibus tenuibus immersis; panicula terminali foliis breviore; floribus subcymoso fasciculatis pedicellisque 1-2 lin. longis pube tenuissima cinerea indutis.

Dixi in honorem cel. Hanno, qui primus naves Carthaginensium secus oras Africæ occidentalis ignotas et post ipsum diu oblitas perduxit.

Species unica

Hannoa *undulata*. *Simaba ? undulata*, Guillem. et Perrot. fl. Seneg. p. 136, tab. 34.

Crescit ad ripas fluminis Gambiæ circa *Albreda*, *Perrot*, *Heudelot*, n. 435, in herb. Hook.

Gen. V. SIMARUBA, *Aubl.*

Flores diclines. Calyx parvus 5 divisus. Petala 5 sub anthesi, apice patentia, æstivatione imbricata. *Masc.* Stamina 10, non exserta, sub disco gynophori basim ambiente inserta; squamula filamentorum brevi. Ovariorum rudimenta lobuliformia minuta v. nulla. *Fæmin.* rudimenta staminum squamiformia, hirsuta, gynophoro vix longiora. Ovaria 5, uniovulata. Styli supra basim connati. Stigma quinquelobum. Drupæ 5 vel abortu pauciores.

Arbores Americæ tropicæ, foliis alternis, imparipinnatis, foliolis sæpius alternis, integerrimis, coriaceis, glaucescentibus, glaberrimis v. rarius pube simplici densa subtus indutis, floribus non conspicuis, in cymulas paniculatas dispositis.

Sp. 1. Simaruba *officinalis*, *Aubl.* Guy. 2, p. 856, tab. 331-332.

S. foliolis sæpius apice subacuminatis, subtus pubescentibus.

Hab. in *Guyana*, *Aubl.*; et in insul. *Caribæis ? DC. prod.*

2. S. *versicolor*, A. S. H. pl. us. tab. 5.

S. foliolis apice obtusissimis, emarginatis, subtus glaberrimis v. molliter pubescentibus, petalis submembranaceis, revoluto patentibus.

Hab. in Brasilia, *Gardner*, n. 1513; *Blanchet*, n. 3142 et 2727.

3. S. *glauca*, DC. prod. 1, p. 733.

S. *officinalis*! Mac Fad. flor. of Jamaic.

S. foliolis glaberrimis, apice obtusissimis, petalis crassis.

Hab. in insula *Cuba*, DC. H.B.K. et in *Jamaica*, *Mac Fadyen* in herb. Hook.

Gen. VI. CASTELA, Turp.

Flores dioici. Calyx brevis, 4 fidus. Petala 4 non longa, æstivatione subcontortim imbricata. *Masc.* Stamina 8, sub

margine disci carnosi, plani, octo crenati inserta, inclusa, alterna petalis opposita cæteris paulo breviora : filamentis subulatis, superne glabris, intus ad basim imam squamula brevissima, pilosa, adnata, appendiculatis : pistilli rudimentum 0 v. rarissime, (fide Cl. Hook.) lobuliforme minutum. *Fœm.* Stamina abortiva. Ovaria 4 gynophoro abbreviato insidentia, approximata ; stylis apicalibus ima basi liberis, mox spatio brevi coadnutatis, iterum distinctis, revoluto patentibus, latere interno stigmatosis, (in C. depressa ex icon. Turpiniana verisim. erronea, styli fere ad apicem connati.) Ovula in carpello quoque solitaria. Baccæ 4, divergentes endocarpio crustaceo a sarcocarpio tenui, amarissimo non solubili. Semen ovatum, funiculo lato brevissimo angulo interno loculi versus medium insertum, semianatropum, micropyle supera ; raphe-brevi ; chalaza latissima colorata ; integumento membranaceo ; albumine parco embryonis recti radicula supera cotyledonibus crassis, plano convexis.

Suffrutices Americani inter et extra tropicos hæmisphæri utriusque observati, habitu ingrato, rhamnoideo, ramis depressis v. erectis, parce foliatis, spinis supra v. infra ? axillaribus armatis, foliis Oleæ v. Rhamni Alaterni, simplicibus, alternis, exstipulatis, petiolis brevibus v. subnullis, cum ramo articulatis, floribus minutis, inconspicuis, viridescenti rubentibus, in fasciculos axillares sæpius depauperatos collectis.

Sp. 1. Castela *depressa*, Turpin in Ann. du Mus. vol. 7.

C. foliis ovali oblongis, basi subcordatis, sessilibus, subtus ramulisque incanis ; spinis axillaribus ; stylo indiviso gracili (fide Turpin.)

In insula *Sanct. Domingi*, *Turpin.*

2. C. *Nicholsonii*, Hook. bot. misc. 1, p. 271, tab. 56.

C. foliis oblongis, basi sæpius acutis, subtus ramulisque incano-sericeis ; spinis axillaribus ; stylis 4 supra basim connatis, mox liberis revoluto patentibus.

In insula *Antigua*, Dr. Nicholson in herb. Hook. ; in montibus *Texas*, *Amer. septentrionalis*, Drummond in herb. Hook. ; nec non in insulis *Gallipagos*, *Oceani Pacifici*, non

procul ab oris *Peruviæ superioris*, Darwin in herb. Hook. fil.

3. C. *erecta*, Turp. l. c.

C. foliis lanceolatis, breviter petiolatis, cortice fusco, glabro? (non tomentoso, *Turp.*) spinis infra axillaribus, floribus fere C. depressæ an ideo stylus indivisus? (*Turpin.*)

In insula *Sanct. Domingi*, *Turp.*

4. C. *Tweedii*, nov. sp.

C. foliis lineari oblongis, breviter petiolatis, utrinque acutis, integerrimis, glabris; spinis junioribus axillaribus, vetustioribus secus ramos denudatos persistentibus, elongatis, ramulos stipantibus, pseudo infra-axillaribus, floribus (masculis) 5-7 axillaribus, fasciculatis.

In provinciis *Parana* et *Banda oriental*, *Brasiliæ extratropicæ*, *Tweedie* in herb. Hook.

5. C. *alaternifolia*, nov. sp.

C. foliis breviter petiolatis, ovali oblongis, utrinque acutis, remote subspinoso denticulatis, v. integris, glabris; spinis ramulorum axillaribus, brevibus, floribus (fœmineis) 2-3 in ramulo abbreviato, bracteolato, breviter pedicellatis; stylis superne liberis, revoluto patentibus.

Chili absque loco proprio, *Herb. Hook.*

Tribus II. Harrisonieæ.

Stamina numero petalorum dupla, filamentis intus squamula parva appendiculatis. Ovaria connata, uniovulata. Embryo intra albumen parcissimum conduplicatus.

Gen. I. Harrisonia, *Rob. Br. MSS. ex Ad. Jussieu, Mem. Rut.* p. 134.

Flores hermaphroditi. Calyx parvus 4 fidus. Petala 4 calice longiora æstivatione subvalvata. Stamina 8 filamentis intus ad basim squamula bifida, ciliata, auctis. Ovario 4, gynophoro brevi inserta, in unum quadrilobum, 4 loculare concreta. Styli basi ima distincti (Ad. Juss.), mox ad apicem connati. Bacca parva, globoso quadriloba, endocarpio non solubili; semen subglobosum ex apice loculi suspensum, campulitropum; embryonis viridescentis cotyledones complanatæ, crassiusculæ, versus medium condupli-

catæ; albuminis lamina tenui intra plicam cotyledonum extensa.

Frutex Archipelagi Malayani, nec non Oræ Novæ Hollandiæ septentrionalis, ramis gracilibus, spinis acutis, raris sparsis, interdum ad basim foliorum, geminatis armatis, foliis alternis, exstipulatis, tri- v. rarius unifoliatis, foliolis ovato oblongis, integris v. basi dentatis, membranaceis, exsiccatione fuscescentibus, cymulis axillaribus pedunculatis; floribus inconspicuis, pedicellis basi bracteolatis.

Sp. unica.

Harrisonia *Brownii*, Ad. Juss. Mem. Rut, tab. 28, n. 47; Gaudich. voy. Freyc. tab. 103.

In insula *Timor*, *All. Cunningh.* in herb. Hook.; in insulis *Zebu* et *Bohol Philippinarum*, *Cuming*, herb. Philipp. n. 1780 et 1828; et in ore septentrionali, *Novæ Hollandiæ*, *Ill. Rob. Br.* ex Cl. *Bennett*.

Gen. II. Lasiolepis, *Bennett, pl. Jav. rar.*

Omnia præcedentis ad quod forsan, non obstantibus floribus pentameris, melius esset referendum.

Sp. unica.

Las. *Bennetii.*

Frutex ramis flexuosis, aculeatis, foliolis ovato oblongis, leviter crenulatis, pubescentibus v. glabris.

Var. α. *paucijuga*, *Lasiolepis paucijuga*, Benn. loc. cit.

Foliolis 3-5 jugis.

In insula *Java*, *Zollinger*, n. 493; in insula *Luzon Philippinarum*, *Cuming*. n. 450.

Var. *multijuga.*—L. *multijuga*, Benn. loc. cit.

Foliolis 9-12 jugis.

In insula *Mindanao Philippinarum*, Cuming. n. 1633.

Trib. III. Aïlantheæ.

Stamina numero petalorum v. dupla, filamentis nudis. Ovaria in floribus 3-5-meris 2-5, libera v. connata, 1 rarius 2 ovulata. Carpella indehiscentia baccata, nucamentacea v. samaroidea; monosperma, altera sæpius effœta; albumen parcum v. nullum; embryonis recti vel subcurvati, radi-

cula semper supera, cotyledones plano convexæ, rarius contortuplicatæ v. in massam indivisam concretæ.

Gen. I. AÏLANTHUS, *Desf. in act. Acad. Par. ann.* 1786; p. 263, tab. 8. Tarrietia? *Blume, bijdr.* p. 227.

Flores polygami. Calyx brevis, 5 fidus. Petala 5 oblonga, æstivatione induplicato valvata, demum patentia, marginibus inferne leviter involutis villosa. *Masc.* Stamina 10-petalis subæqualia sub disco plicato, 5 lobo, inserta. Ovariorum rudimenta inter se distincta. *Hermaphrod.* (v *fœmin.?*) Stamina abortu pauciora. Ovaria 5 distincta, compressa. Styli totidem antice infra apicales, subliberi, apice dilatato intus stigmatosi. Samaræ 5 v. sæpius abortu pauciores, oblongæ, intus versus medium leviter emarginatæ, monospermæ. Semen subperitrope suspensum, integumento membranaceo, hilo elongato hinc micropyli superæ, illinc chalazæ sub-anticæ (nec micropyli e diametro oppositæ) proximo. Embryo intra laminam albuminis tenuem rectus; radicula brevis, cotyledones crassiusculæ planæ.

Arbores excelsæ, inter et extra tropicos Indiæ crescentes, foliis impari v. abrupte pinnatis, foliolis petiolulatis, basi inæquilateris, grosse glanduloso dentatis v. integerrimis, non pellucido punctatis, livide virescentibus et fœtidis, membranaceis, glabris v. pube simplice rufo-cinerea, detergibili, indutæ, paniculis ad apices ramorum foliosorum subterminalibus, laxis, multifloris; floribus polygamis, inconspicuis, virescentibus; pedicellis longiusculis, basi bracteolatis, subfasciculatis.

Sp. 1. Ailanthus *excelsa*, Roxb. Corom. tab. 23; Wight ill. of Ind. bot. 1, tab. 67.

A. foliis magnis, abrupte pinnatis, foliolis longe petiolatis, basi valde obliquis, grosse dentatis.

In Montibus *Circars, Ind. Orientalis,* versus oram *Coromandeliæ.*

2. Ailanthus *glandulosa*, Desf. l. c.; L'Herit. Stirp. tab. 84.

A. foliis imparipinnatis, foliis basi grosse glanduloso dentatis, v. rarius subintegris.

In *China !* et *Moluccis ?* indigena, nunc in *Europa* præsertim *australi* frequentissime culta.

3. Ailanthus *Malabarica*, DC. prod. 2, p. 89.

Ail. *integrifolia* β. Lamk, dict. 3, p. 417.

Pongelion, Rheed. hort. Malab. 6, tab. 15.

A. foliis abrupte pinnatis, foliolis longis, falcatis, integerrimis; samaris obtusis, inferne connatis ? (verisimiliter casu ut in sp. aliis non raro observatur.)

In ora *Malabarica, Rheed*; *Bombay ? Gibson* in herb. Hook.

Spec. non satis nota.

4. Ailanthus *Moluccana*, DC. prod. 2, p. 29.

A. *integrifolia*, α. Lamk. Not. 3, p. 217.

Arbor cœli s. caju langit, Rumph. Amb. 3, p. 205, tab. 132.

A. foliis abrupte pinnatis, 5-6 jugis, foliolis integerrimis, eglandulosis (Lamk.); samaris inter se liberis.

Arbor maxima. (Rumph.)

In insulis *Moluccanis.*

An ab A. *glandulosa* satis differt ?

Obs. *Tarrietia Javanica*, Blume, bijdr. p. 227, ab auctore ad Malpighiaceas, a Cl. Endlichero ad calcem sapindacearum referta, videtur esse *Ailanthi*, sp. quæ foliis 5 foliolatis a præcedentibus facile distinguitur.

Gen. II. Picrasma, *Blume bijdr*. p. 247; *Benn. pl Jav. rar.* p. 197 et 198.

Nima, Hamilt. MSS.
Quassiæ sp. Swartz.
Simabæ sp. Don.
Simarubæ sp. DC.
Rhois sp. Bung.
Picræna, Lindl. fl. Med. p. 208.
Muenteria, Walp. repert. bot. vol. 5. p. 398.
Æschryon, Fl. Flum. vol. 1, tab. 152.

Fl. diclines v. polygami ? Calyx minutus 4-5 dentatus. Petala 4-5 ovata, basi lata, in floribus fœmineis sæpe accreta,

in masc. marcescentia. *Masc.* Stamina 4-5 petalis alterna, sub disco crasso inserta, filamentis subulatis inferne pilosis, antheris parvis. *Fœm.* v. *hermaphrod.?* Stamina 0, v. effœta? Ovaria 3-5 disco crasso insidentia, distincta, stylis totidem apicalibus supra basim in unum concretis. Drupæ 1-3 pisiformes, receptaculo incrassato insertæ, monospermæ. Semen plus minus semi anatropus, peritropus v. subascendens; integumentum membranaceum, embryo intra albumen carnosum rectus, radicula supera.

Arbores in *Napalia, China boreali, Java, Antillis*, et insula *St. Catharinæ Brasiliæ meridionalis*, observatæ, habitu *Ailanthi* v. *Picramniæ*, foliis alternis, imparipinnatis, foliolis integerrimis, v. glanduloso dentatis, pari infimo interdum subabortivo stipularum formam induente; floribus inconspicuis in cymas axillares pedunculatas, versus apicem ramorum collectis. Partes omnes insigniter amaræ.

Sp. 1. Picrasma *Javanica*, Blume bijdr. p. 248; Benn. l. c. tab. 41.

P. foliolis 5-nis (nunc 3-nis) breviter acuminatis, integerrimis, floribus 4-meris.

In insula *Java, Blume, Horsfield*.

2. Picrasma *Napalensis*, Benn. loc. cit. p. 201.

P. foliis septenis (nunc 3-nis) longius acuminatis, integerrimis, floribus 4-meris.

In Napalia.

3. Picrasma *Quassioides*, Benn. l. c. p. 198, in *annot.*

Nima Quassioides, Hamilt. MSS.

Simaba Quassioides, Don.

Brucea Napalensis, Wall. in herb. Hook. (ex collectione privata, absque numero.)

P. foliolis 9-15, acuminatis, serratis, pari infimo interdum stipularum formam induente; floribus 5-meris; pube brevi, ferruginea, novella, petiolos, inflorescentiam induente, sub foliis rariore.

In *Napalia*.

4. Picrasma *Ailanthoides*.

Rhus Ailanthoides, Bunge enum. pl. Chin. bor. p. 15.

P. (gemma terminali excepta) glaberrima, foliolis 7-11, ovato oblongis, acuminatis, glanduloso serratis, cyma (mascula) brevi, pauciflora, floribus pentameris.

In *China, mont. Zui-wey-Schan,* Bunge; (vid. sp. sicc. in herb. Hook. e ditissimo Musæo Petropolitano communicatum.)

5. Picrasma *excelsa.*

Quassia excelsa, Sw. fl. Ind. occid. p. 742; Mac. Fad. fl. of Jam. p. 198; Wagner, pl. med. tab. 259.

Simaruba? excelsa, DC. prod. 1, p. 733.

Picræna excelsa, Lindl. fl. Med. p. 208.

P. foliolis, 9-11, ovato oblongis, obtuse acuminatis, basi obliquis, integerrimis, supra glabris, lucidis, subtus in nervis puberulis v. glabris; cymis terminalibus, foliis brevioribus, dichotomis, pedicellisque brevibus pube brevi, simplici, lutescente, interdum subresinosa, indutis.

In sylvis *Jamaicæ, Purdie,* in herb. Hook.; et *Antiguæ,* Dr. Nicholson.

6. Picrasma *Vellozii.*

Æschryon crenata, Fl. Flum. vol. 1, tab. 152.

P. foliolis 9-11 oblongis, basi acuta valde obliquis, remote glanduloso serratis, glabrescentibus, submembranaceis, cymis terminalibus pubescentibus, floribus P. *excelsæ.*

In insula *Stæ. Catharinæ, Bras. Meridional., Tweedie.*

Gen. III. Brucea, *Mill.*

Flores dioico polygami. Calyx 4 partitus. Petala 4 minuta, linearia apice inflexa. *Masc.* Stamina 4, sub disco 4 lobo, glanduliforme, inserta, petalis alterna; filamenta nuda; antheræ subrotundæ, biloculares, loculis introrsis, connectivo non conspicuo sejunctis. *Fæmin.* Stamina 4-effœta, (in hermaphrod. fertilia.) Ovaria 4 gynophoro depresso insidentia, approximata uniovulata. Styli totidem, lineares, breves, subapicales, recurvo-patentes, intus stigmatosi. Drupæ 4 subsiccæ, parvæ, endocarpio rugoso ab epicarpio non solubili. Semen *Ailanthi,* sed non compressum.

Frutices inter Tropicos *Africæ* et insularum *Indiæ* vigentes;

foliis alternis, exstipulatis, imparipinnatis; foliolis basi obliquis, integerrimis vel grosse serratis; glomerulis florum densis, v. cymulis brevibus, in spicas strictas dispositis, floribus inconspicuis, purpurascentibus; pedicellis brevibus basi bracteolatis.

Pubes simplex, rufescens, sæpius densa, novella, imprimis petiolos, inflorescentiam, imo calyces et petala induens. Sapor amarissimus; vires, ut plurium affinium, febrifugæ.

Sp. I. Brucea *antidysenterica,* Mill.

Br. pubescenti hirsuta; foliolis integris; glomerulis florum interrupte spicatis, calicibus petalisque extus dense hirtellis.

In *Abyssiniæ* collibus siccis, prope *Adoam,* Schimp. Fl. Abyss. coll. sect. 1, n. 234.

2. Brucea *paniculata,* Lamk. dict. 1, p. 472.

Br. Guineensis, Don, gen. syst. v. 1, p. 800.

Br. tenuissime pubescens v. subglabrata; foliolis integerrimis; corymbulis spicatis; calicibus, inflorescentia, pedicellisque parce et adpresse pilosis.

In montibus *Sierra Leone, Africæ Occidentalis, Smeathem,* ex Lamk.; *Don,* in herb. Hook.

3. Brucea *Sumatrana,* Roxb. fl. Ind. vol. p. 449.

B. *gracilis ?* DC. prod. 1, p. 88.

Br. velutino pubescens, v. subglabrata; foliolis grosse dentatis, floribus masculis in cymulas brevissimas, spicatas condensatis, fœmineis glomerulato spicatis; laciniis calyciniis linearibus.

In insulis *Archip. Malayani; Sumatra, Java, Zollinger,* n. 214; nec non in continente *Ind. Orient.* prov. *Mergui, Griffith; China, Millett.*

4. Brucea *glabrata,* Decaisn. Descript. herb. Tim. p. 119, tab. 20.

Br. subglabrata; foliolis remote et obtuse dentatis; floribus hermaphroditis spicatis; laciniis calycinis ovatis.

Insula *Timor, All. Cunningh.* in herb. Hook. specim. imperfect.

A præcedente vix diversa.

Gen. IV. SOULAMEA, *Lamk. Dict.* 1, 449.

Cardiophora, Benth. in Hook. Lond. Journ. of Bot. 2, p. 216.

Flores hermaphroditi? Calyx minutus, 3-partitus. Petala 3 linearia, reflexo patentia. Stamina 6 sub disco patelliformi, trilobo, subbiseriatim inserta. Ovarium compressum, apice emarginatum, biloculare. Stigmata linearia, sessilia, oblique introrsa, inter se distantia. Ovula in loculis solitaria, angulo interno sub apice loculi suspensa. Capsula indehiscens, obcordata, compressa, alato-marginata, bilocularis, disperma. Semina *Ailanthi*, umbilico nudo, albuminis lamina tenui.

Arbuscula *Moluccana* et *Oceanica*: foliis alternis, exstipulatis, simplicibus; petiolo longiusculo, apice subincrassato et sub geniculato nec articulato, lamina obovato-oblonga, integerrima, membranacea, glabrescente, livide virescente; floribus minutis, glomerulato spicatis.

Sp. unica,

Soulamea *amara*, Lamk. l. c.; Endl. in Ann. Wien. Mus. 1, p. 188, tab. 16.

Rex amaroris, Rumph. Amb. II. p. 129, tab. 40.

In *Moluccis*, *Rumph.*

Gen. V. PICRAMNIA, *Sw. fl. Ind. occid.* 1, *p.* 218, *tab.* 4; (*descript. et icon. quoad flores masc. malæ.*)

Char. reform.

Flores dioici. Calyx 3-5 partitus. Petala 3-5 linearia, apicibus acutis æstivatione inflexis. *Masc.* Stamina 3-5 petalis opposita! sub disco depresso, lobato, inserta, filamentis subulatis, nudis, æstivatione inflexis, antheris introrsis, loculis connectivo crassiusculo sejunctis. *Fœm.* Squamulæ lineares (stam. rudim.) petalis oppositæ. Ovarium disco depresso insidens, 2- rarius 3-loculare loculis 2-ovulatis. Stylus brevis, 2-3 fidus, divisuris dentiformibus, recurvis, intus stigmatosis. Bacca olivæformis, bi- rarius abortu unilocularis, loculis abortu monospermis. Semen

ex septi apice pendulum, facie planum, dorso convexum; anatropum; integumentum membranaceum, pallide rufescens, embryoni subjecto arcte adhærens. Embryo e massa indivisa constans, puncto radiculari inconspicuo.

Frutices *Americæ tropicæ*, foliis alternis, exstipulatis, imparipinnatis, foliolis sæpius subalternis, basi plus minus obliquis, integerrimis, rigide membranaceis v. coriaceis, floribus parvis, rubescentibus, glomerulato v. fasciculato-spicatis, spicis sæpius oppositifoliis et deflexo-pendulis, non raro geminatis et ramosis.

Flores pentameri.

Sp. 1. Picramnia *pentandra*, Sw. fl. Ind. occid. 1, p. 220.

P. foliolis 9 ovatis, obtuse acuminatis, glabris, subcoriaceis, nitidis, reticulato-nervosis, paniculæ terminalis ramis strictis, adpresse pubescentibus.

In insula *Montserrat*, (Ryan, ex Sw.); et insula *Antigua*, Nichols. in herb. Hook. specim. imperfect. fructiferum.

2. Picramnia *polyantha.*

Rhus polyantha, Benth. pl. Hartw. p. 60.

P. foliolis 9 ovato-lanceolatis, longe acuminatis, supra glabris, subtus cano-puberulis v. glabrescentibus, subcoriaceis, paniculæ ramosissimæ floribundæ ramis congestis, brevibus v. elongatis, pedicellis et calicibus cano-puberulis, petalis linearibus, acutissimis, atro-purpureis.

Mexico, in montibus *Chinantla*, loco dicto *Villa Alta*, Hartw. n. 453; et in montibus *Sierra San Pedro Nolasco*, Jurgensen, coll. ann. 1843-1844, n. 579.

3. Picramnia *Xapalensis*, nov. sp.

P. foliolis multis, parvis, sæpius alternis, ovatis v. ovato-lanceolatis, longe acuminatis, basi valde inæquilateris, glabriusculis, membranaceis, petiolis nervisque mediis foliorum subtus pubescentibus, panicula et floribus præcedentis.

Mexico, in montibus prope *Xalapam*, Galeotti, coll. ann. 1840, n. 3506.

Obs. Sp. a congeneribus foliolis numerosis, parvis, membranaceis, facile distinguenda.

4. Picramnia *sphærocarpa*, nov. sp.

P. foliolis 13-15 elliptico-lanceolatis, basi subcordatis, obtuse acuminatis, integerrimis, supra glabris, subtus petiolisque et inflorescentia dense hirtellis; floribus pro genere majusculis, glomerulato-spicatis; spica ramosa, sæpius deflexa; pedicellis crassis, brevibus; baccis globosis.

Foliola 1½-2 poll. longa, 6-10 lin. lata, coriacea, obscure rufo-flavescentia, coriacea, nervo medio supra valde impresso, venis tenuiter immersis, subtus, ut costa, prominentibus; petioluli 1 lin. longi; bacca cerasiformis, nigra.

In regn. *Nov. Granat.* non procul ab urbe *Sta. Fe de Bogota*, Purdie.

5. Picramnia *Sellowii*, nov. sp.

P. foliolis 7-11 confertis, oblongis, basi valde obliquis, brevissime acuminatis, supra parce, subtus dense pubescentibus; paniculæ terminalis v. axillaris folio subbrevioris ramis crassis; calicibus pedicellisque dense pubescentibus.

Brasilia, Sellow in herb. Hook. absque loco proprio; *Serra de Araripe*, Gardn. n. 1532.

6. Picramnia *ramiflora*, nov. sp.

Picramnia foliolis 9-11 sæpius alternis, oblongo-lanceolatis, basi cuneatis v. oblique attenuatis, apice cuspidatis, glabris, nervosis, racemis (fructiferis) solitariis v geminatis, simplicibus, e ramis infra folia ortis.

Brasilia, Gardn. n. 2022; Sellow, n. 1277.

7. Picramnia *Gardneri*, nov. sp.

P. foliolis 5-7 sæpe alternis, ovatis v. obovatis, abrupte et obtuse acuminatis, glaberrimis, lucidis, rigide membranaceis, floribus (masculis) glabriusculis, in glomerulos densos, alterne et interrupte spicatos, collectis.

In *Brasilia* prope *Rio de Janeiro*, Gardn. n. 16.

Flores trimeri.

8. Picramnia *Antidesma*, Sw. fl. Ind. occid. p. 218.

P. foliolis 7-9 sæpe alternis, ovato-lanceolatis, basi plus minus acute obliquis, acuminatis, glabris v. puberulis, racemis spiciformibus terminalibus v. rarissime infra folia ortis, longissimis.

Var. α. foliolis glaberrimis, lucidis, subcoriaceis.

Var. β. *glabrescens*, foliolis subtus in venis pubescentibus, membranaceis.

P. *Antidesma*, Schlecht. in Linn.

Cicca macrostachya, Benth. Bot. of the Sulph.

Hab. var. α. in fruticetis montium *Jamaicæ* et *Hispaniolæ*, Sw., Purdie in herb. Hook.—Var. β. in sylvis *Xalapensibus*, *Papantlensibus*, et ad *Tlacolula*, regni *Mexicani*, Schiede; in provincia *Teapa*, Galeotti, n. 824; et in provincia *Guadalajara*, prope pagum *San Blas*, Dr. Sinclair.

9. Picramnia *ciliata*, Mart. in Flor. vol. 22, beibl. p. 20, ex Walp. Rep.

P. ramulis novellis, rachidibus foliorum, paniculisque pubenti-tomentosis; foliolis ovato-lanceolatis v. lanceolatis, acuminatis, basi inæquali rotundatis, supra nitidis, subtus pubescentibus, margine ciliatis; floribus masculis, trimeris, triandris. (Mart. l. c.)

In sylvis *Brasiliæ*, prope *Rio de Janeiro*.

Gen. VI. Picrodendron, Nov. gen.

Rhois sp. auct.

Flores ignoti. Drupa subglobosa, carne tenui, amarissima, nucleo duro, non solubili, indehiscente, revera bilocularis loculis 2-spermis, sed abortu unilocularis, monosperma. Septum evolutione seminis ad parietem loculi dejectum. Semen ex apice loculi pendulum, irregulariter ovatum, antice profunde 1-sulcum, inferne bilobum; micropyle supera, umbilico subcontigua; integumentum membranaceum; raphe intra sulcum seminis antice excurrens, in chalazam linearem nigram, inter seminis lobos inferiores terminata. Albumen 0. Cotyledones plicatæ, conferruminatæ.

Arbor excelsa; foliis alternis, exstipulatis, trifoliolatis, petiolo longo, foliolis oblongis basi subæquali in petiolum longiusculum attenuatis, obtusis, mucronulatis, margine tenui, revoluto, minutissime subcrenulatis, supra livide virentibus, glabris, subtus glauco-lutescentibus, secus nervos puberulis, chartaceis, inter reticulum nervulorum translu-

centibus (nec tamen pellucide punctatis); pedunculis solitariis, unifloris, fructu ceraso communi majore.

Picrodendron *arboreum.*

Rhus arborea, DC. prod. 2, p. 73; Mac Fadyen, fl. of Jam.
In montibus *Jamaicæ,* Mac Fadyen, in herb. Hook.

Tribus IV. Spathelieæ.

Stamina numero petalorum, filamentis intus squamula adnata, bifida v. profunde bipartita auctis (in *Spath. glabrescente* nudis.) Ovaria discreta v. in unum connata, loculis 1-5 ovulatis.

Genus I. Spathelia, *L.*

Flores polygami. Calyx 5-partitus, laciniis æstivatione valvatis v. subvalvatis, demum patentibus. Petala 5, calice non multum longiora, æstivatione imbricata. *Masc.* Stamina 5, petalis alterna, filamentis complanato-subulatis, sæpius intus ab basim squamula bifida, adnata, appendiculatis, nunc nudis! Ovarii rudimentum conicum, apice tridentulatum, gynophoro brevissimo insidens. *Hermaph.* Stamina maris. Ovarium trigonum, triloculare. Stylus brevis, apice trifidus, divisuris intus stigmatosis. Ovula in loculo quoque gemina, angulo interno sub apice affixa, anatropa, pendula. Drupa (ex Gaertn. carp. I. pl. 278, tab. 58, f. 3,) exsucca, triquetro-alata, trilocularis, putamine lapideo ab endocarpio non solubili, ovato, acuminato, seta rigida pedunculato, rotundo-trigono, angulis atque loculamentis appendice teretiuscula superne in mucronem promente, interne autem canaliculata atque resina fluida scatente, stipatis. Semen in loculo singulo unicum, teretiusculum, utrinque acuminatum, facie leviter unisulcum; integumentum simplex, e fibris transversis, cocculi bombycini adinstar contextum, antice cum endocarpio longitudine tota concretum. Albumen crassiusculum, carnosum. album. Embryo longitudine seminis, cotyledonibus lineari-oblongis, compressis, tenuibus, radicula brevissima, supera.

Arbores Antillanæ, monticolæ, proceræ et speciosæ, foliis alternis, exstipulatis, amplis, abrupte multijugis, rachi nuda vel intra foliola angustissime marginata foliolis lineari-ob-

longis, basi obliquis, sæpius falcatis, minutissime v. grosse crenatis, margine revoluto minute glanduliferis, impunctatis; paniculæ terminalis, vastæ, pyramidalis, ramis extremis subcymosis; floribus non magnis, pallide v. vivide rubentibus, breviter pedicellatis; bracteis, minutissimis, lineari-subulatis.

Sp. 1. Spathelia *simplex*, L. sp. pl. ed. 2, vol. 1, p. 386; Ker, in bot. reg. tab. 670.

Sp. foliolis magnis, lineari-oblongis, falcatis, crenatis, subtus petioloque communi obtuso trigono puberulis; filamentis staminum appendiculatis.

In montibus *Jamaicæ*, Purdie, in herb. Hook.

2. Spathelia *glabrescens*, nov. sp.

Glabrescens, foliolis magnis, lineari-oblongis, falcatis, basi obtusis, minutissime crenulatis, petiolo communi angulato, v. tereti filamentis staminum exappendiculatis!

Folia 2-3 ped. longa; foliola sæpius alterna, 2-3 poll. longa, 8-10 lin. lata, breviter petiolata, basi obtusa, apice in mucronem latum glandulosum producta, margine tenui, vix non revoluto, minute crenulato, glandulis resinosis, conspicue pellucidis, crenaturæ singulæ interjectis; nervi laterales venæque utrinque tenues; pubes supra frondescentiam vix nulla, versus ramos paniculæ extremos et pedicellos, rara, cinerascenti, pulverulenta.

In montibus *Jamaicæ*, Dr. Distan, in herb. Hook.

3. Spathelia *vernicosa*, nov. sp.

Glaberrima, vernicoso-lucida; foliolis parvis, oblongo-ellipticis, utrinque obtusis, crenato-serratis, petiolo communi angustissime alato; staminum filamentis appendiculatis.

Species pulchra, distinctissima; folia 1-1½ ped. longa, petiolo non crasso, supra sulcato et inter foliola angustissime marginato; foliola 15-18 lin. longa, 4-5 lin. lata, supra nitida, avenia, subtus pallidiora; panicula vasta, subresinoso-vernicosa; flores lætissime rubri; laciniæ calycinæ valvatæ.

In insula *Cuba*, Linden. coll. ann. 1843-1844, n. 1943.

Genus II. Dictyoloma, *DC. in Ad. de Juss. Mem. Rut.* p. 116.

Benjaminia, Fl. Flum. vol. 2, tab. 139.

Flores abortu diclines (an polygami ?). Calyx minutus, 5-partitus. Petala 5, anguste oblonga, basi lata, æstivatione marginibus leviter imbricata, apice acuto vel in appendicem linearem producto introflexa. *Masc.* Stamina 5, petalis alterna. Filamenta subulata, intus ad basim squamula bifida adnata appendiculata. Ovarii rudimentum gynophoro brevi impositum. *Hermaph.* Stamina maris (in fœmin. pollinis defectu imperfecta). Ovaria 5, gynophoro brevi imposita, in sinu umbilicata, distincta ; stylis totidem supra basim in unum connatis. Stigma 5-lobum. Carpella ad angulum internum 4-5 ovulata ; ovulis 4 superioribus collateraliter geminatis, funiculis longiusculis sustensis, infimo sterili, minuto. Capsulæ 5, distinctæ, compressæ, introrsum bivalves, 3-4-spermæ. Semina late reniformia, compressa. Integumentum dorso in alas duas eleganter radiatim reticulatas expansum. Embryo intra laminam albuminis tenuem arcuatus, teretiusculus ; radicula supera.

Arbusculæ Americæ meridionalis tropicæ, foliis alternis, exstipulatis, alterne bipinnatis, pinnis secundariis propter rachin primariam, foliolis propter pinnas gradatim a basi versus apicem evolutis ; foliolis sæpius alternis, basi inæqualibus, margine revoluto subintegerrimo, glandulis resinosis, semipellucidis, consperso ; paniculæ terminalis ? vastæ, ramis extremis cymosis ; floribus inconspicuis, sicut folia et inflorescentia, plus minus cinereo-pubescentibus.

Sp. 1. Dictyoloma *incanescens*, DC. prod. 2, p. 89.

D. Vandellianum, Ad. Juss. Mem. Rut. 116, 164, tab. 24 ; fide Aug. St. Hil. et Tulasn, in ann. des sc. nat. nouv. sér. vol. 17, p. 139.

Benjaminia alata ? Fl. Flum. vol. 2, tab. 139.

D. foliolis oblongis, utrinque acuminatis, integerrimis, supra glabris, subtus pube adpressima tenuissima, plumbeo-ca-

nescentibus, petalis in appendicem linearem, longiusculam, productis.

In provincia *Rio de Janeiro*, haud infrequens, A. S. H. et Tulasne; *Ilhios*, ex specim. Cl. *Moricand* communicat.

2. Dictyoloma *Peruvianum*, nov. sp.

D. foliolis numerosissimis, parvis, lineari-oblongis, integris, supra obscure virentibus, puberulis, subtus canescentibus; rachi primaria subtereti, secundariis oppositis v. alternis, inter juga anguste alatis; petalis breviter mucronulatis.

Spec. distinctissima; folia circumscriptione elliptica, 1-½ ped. longa; pinnæ 20 et ultra, intermediæ 12-15 jugæ; inferiores et supremæ breviores, depauperatæ: foliola 8-12 lin. longa, 3-4 lata, rigide membranacea; paniculæ terminalis? ramis compresso-teretibus, divaricato-cymosis; flores griseo-sericei, subsessiles. Ovaria dense tomentosa.

In *Peruvia*, Mathews, n. 1657, in herb. Hook.

Gen. III. Eurycoma, *W. Jack.*

Flores polygami. Calyx minutus, cupuliformis, quinquedentatus. Petala 5 oblonga, æstivatione induplicato-valvata, demum patentia, marginibus involuta. *Masc.* Stamina 5, petalis alterna. Filamenta utrinque ad basim ligula lineari-obovata appendiculata. Ligulæ in alabastro staminibus exteriores. Ovaria abortiva. *Hermaphrod.* Petala mascul. sed subdimidio minora. Stamina 5. Ligulæ filamenta utrinque stipantes, minutæ, quàm in fl. masc. breviores et latiores. Ovaria 5, distincta, sessilia, approximata, intus sub apice anguli interni uniovulata. Styli 5 mox in unum apice quinquefidum concreti. Capsulæ 5, breviter stipitatæ, ellipsoideæ, utrinque obtusæ, secus faciem nervo elevato carinatæ, maturæ dehiscentes (fide *Cl. Jack.*). Semen pendulum, exarillatum, exalbuminosum (*Cl. Jack.*)

Arbores Burmannicæ, Malaccenses et insularum Archipelagi Malayani, humiles; ramis crassis, cicatricibus foliorum inferne notatis, apice frondosis; foliis alternis, exstipulatis, cum impari multijugis, foliolis subalternis, oblonge v. anguste ellipticis, basi obliquis, integerrimis; paniculæ

subterminalis, vastæ, ramis strictis ramulisque compressis; floribus obscuris, evolutione diversa inæquilonge pedicellatis, masculis in eadem inflorescentia cum hermaphroditis intermixtis. Color plantæ totæ rufescens. Pubes in ramis et petiolos simplex, brevissima, tenuis, rufa; in inflorescentia et floribus, pilis apice glanduliferis, intermixta. Sapor amarissimus. Vires febrifugæ.

Sp. 1. Eurycoma *longifolia*, W. Jack.

E. petalis floris masculi 3 lin. longis, filamentis sexus utriusque glabris v. ad basim intus sub lente valida parcissime pilosis.

Sumatra, (W. Jack.); *Ins. Penang*, Wallich, Griffith, in herb. Hook.

2. E. *Merguensis*, nov. sp.

E. petalis floris masculi vix 2 lin. longis, filamentis undique conspicue pilosis.

Præcedenti simillima et cum ea a cl. inventore et a me ipso diu confusa, sed charactere indicato, panicula breviore, magis conferta, densissime glandulosa, et floribus conspicue minoribus certe distincta.

Obs. Sp. utraque variat foliolis submembranaceis v. coriaceis; petiolo communi tereti, minute velutino, v. subangulato et glabrato.

In provincia *Mergui*, regni *Burmannici*, Griffith in herb. Hook.

Sur le genre Godoya *et ses analogues, avec des observations sur les limites des* Ochnacées, *et une revue des genres et espèces de ce groupe; par* J. E. Planchon, *docteur-ès-sciences.*

(*Avec deux planches*, Tab. XXI, XXII, and XXIII, XXIV).

Le *Godoya obovata*, R. et P., type du genre dont il a seul fourni les caractères, est un arbre d'un beau port, dont les grandes feuilles alternes, presque sessiles, très entières à leur

base et bordées de dents régulières sur le reste de leur contour, sont remarquables par leur texture coriace, le poli de leur surface supérieure, et le réseau de venules qui sur l'inférieure se dessine entre des nervures secondaires droites et parallèles. Ses rameaux cylindriques sont marqués de cicatrices en apparence annulaires, mais en réalité formées de deux demi anneaux qui, par l'un de leurs bords touchent aux deux côtés de la feuille, et se rapprochent sans se joindre par les bords opposés. Sur les axes de la grappe rameuse qui termine les branches, ces mêmes cicatrices se retrouvent plus prononcées; en sorte que ces axes paraissent articulés sur leur longueur, comme les pédicelles le sont à leur base. Il suffit de signaler ici ces cicatrices comme influant sur l'aspect de la plante; leur origine ne pourra être comprise que par la comparaison avec d'autres plantes. Un calice auquel cinq pièces écailleuses, imbriquées et caduques donnent l'apparence d'un bourgeon; cinq pétales réguliers; dix étamines à filets courts, dont les anthères alongées s'ouvrent par deux pores étroits placés sur leur dos et presque à leur sommet; un ovaire légèrement infléchi vers un seul côté de la fleur, tandis que les étamines se déjètent dans le sens opposé; une capsule dont les cinq valves polyspermes, désunies par une déhiscence septicide, restent long-temps suspendues à dix faisceaux fibreux de la columelle; enfin des graines menues et bordées d'une aile étroite; tels sont les traits saillants qui caractérisent l'espèce type du *Godoya.*

Il n'est rien dit dans cette description de cinq faisceaux de filaments courts que Ruiz et Pavon décrivent et figurent comme le *nectaire* de cette plante, et qu'ils supposent alterner avec les pièces calicinales. Trompés par cette assertion, MM. Martius et Zuccarini ont cru retrouver dans ces organes les filaments stériles qu'ils observaient autour des étamines de leur *Godoya gemmiflora*; et, par suite, en remodelant les caractères du genre, ils ont rendu le mot vague de nectaire, en décrivant des filaments stériles distribués en cinq faisceaux. L'analyse d'un bouton floral va sur ce point fixer nos idées. Sous la première écaille qui s'en détache, paraît

une rangée simple de filaments bruns demi-transparents et fragiles, qui ne présentent, à une faible loupe, aucune trace d'organisation. Chacune des écailles qui suivent cache une rangée de pareils corps ; seulement comme la base d'insertion des écailles est d'autant plus étroite qu'elles sont plus intérieures, le nombre des filaments diminue en proportion. Ainsi, ces supposés rudiments d'étamines, au lieu de s'accroître en nombre à mesure qu'ils approchent des verticilles staminaux, viennent justement finir au point où l'on aurait cru les voir commencer. Il faut donc les suivre dans leur gradation descendante, des verticilles floraux internes vers les extérieurs et même vers les bractées ; et, pour cela, comme les bractées trop caduques du *Godoya obovata* ne laissent sur les grappes fleuries que les traces de leur insertion, il faut diriger notre attention vers le *Godoya spathulata*, espèce que Ruiz et Pavon ont rapprochée de la précédente.

Ici, le calice, au lieu de grandes écailles libres et imbriquées, présente cinq lobes très courts dont les bords se recouvrent à peine et dont les bases légèrement soudées sont absolument nues à leur face interne. Sa grande panicule pyramidale conserve, à la base de son axe primaire, le bourgeon écailleux qui a dû lui servir d'enveloppe protectrice. Si l'aspect de ces écailles imbriquées et leur ressemblance frappante avec les pièces calicinales de l'autre espèce, faisaient voir dans leur ensemble un involucre, un calice commun à toutes les fleurs d'une panicule, on pourrait caresser l'idée sans se permettre d'user le terme ; et cependant, la nature semble presque justifier cette hardiesse.

En effet, sous ces écaille gemmaires, si éloignées des calices partiels, se trouvent les mêmes rangées de filaments qui, chez le G. *obovata*, occupaient la base interne des folioles calicinales. Si leur place dans ce dernier cas a pu les faire prendre pour des étamines mal développées, on ne saurait les retrouver dans un bourgeon, sans se faire d'autres questions sur leur nature. Seraient-ils analogues à ces touffes de poils roides, qui occupent la base des feuilles, chez la plupart des Portulacées ? ou mieux, peut-être, à ces corps glanduleux qui,

chez les Apocynées, s'observent si fréquemment à la base interne des calices ? Dans le fait, les filaments axillaires des *Godoya*, également distincts par leur substance et leur forme, des deux sortes d'organes accessoires dont ils occupent les places respectives, diminuent la distance de l'un à l'autre et montrent, à l'appui de mille autres faits, que la forme seule des organes nous cache cet unité d'essence et de principe, qui se trahit dans leur ensemble et s'efface à mesure que les faits sont isolés.

Résumer les détails qui précèdent, c'est établir un contraste entre les deux espèces Péruviennes de *Godoya*. Chez l'une (G. *obovata*), de grands calices gemmiformes, dont les écailles caduques recouvrent chacune une rangée de filaments ; une inflorescence dont la base, comme les axes partiels, n'offre au temps de la floraison que les cicatrices des bractées. Dans l'autre espèce (G. *spathulata*), un calice très court, entièrement dépourvu d'appendices ou de rangées de filaments ; un bourgeon écailleux qui ceint la base d'une grande panicule, et dont les pièces isolées se confondraient avec les sépales du G. *obovata*. Admettant sur de telles différences la distinction générique des deux plantes, et conservant à cette dernière le droit de représenter le genre *Godoya*, il s'agit de compléter les caractères de l'espèce, qui doit recevoir un autre nom.

C'est encore un arbre d'un port élégant ; ses feuilles alternes, rétrécies en pétiole, sont bordées de dents profondes, écartées et régulières. Des nervures secondaires transversales et parallèles, se dessinent, plutôt en creux qu'en relief, sur leurs deux surfaces ; des veines onduleuses, finement imprimées, s'étendent transversalement entre ces nervures. Au-dessous des écailles imbriquées qui ceignent la base de la panicule, quelques autres plus laches occupent la partie feuillée des rameaux, sans affecter par rapport aux pétioles une position assez constante, pour mériter le nom de stipules. Des gouttes d'une matière en apparence gomme-résineuse, se montrent desséchées, à tous les points de

l'inflorescence qui ont éprouvé quelque lésion. Les pétales sont beaucoup plus longs que le calice ; et les étamines nombreuses (30-40) sont, dans la fleur non épanouie, également distribuées autour du pistil. Ce dernier, comme le fruit, rappelle les organes correspondants du *Godoya.*

Aux traits que je viens d'esquisser, on doit reconnaître sans peine dans le G. *spathulata*, une seconde espèce du genre *Cespedesia*, récemment décrit par M. Goudot. Tout coïncide, en effet, entre la plante que j'ai sous les yeux et la description heureusement très détaillée du C. *Bonplandi*, excepté que les pièces du calice y sont indiquées comme distinctes, tandis que je vois, dans celles du *Cespedesia spathulata*, des lobes à peine imbriqués et légèrement unis à la base. Cependant, comme il est question d'un côté d'un pedicelle renflé sous le calice, et que de l'autre, je vois sur la partie où les sépales se confondent cinq sillons qui dessinent leurs limites, il est très probable que les différences en question existent dans les termes plus que dans le fait.

Ainsi nous venons de rattacher une espèce Péruvienne à la flore de la Colombie. En revanche, cette dernière contrée va fournir au *Godoya* du Pérou, une addition aussi brillante qu'inattendue. C'est ce que dira mieux que des paroles, le dessin qui accompagne cet article (voy. tab. XXI, XXII). De grandes feuilles pinnées à folioles coriaces et luisantes ; une vaste panicule de fleurs en rose ; de longues anthères élégamment courbées et dejetées en demi cercle, autour d'un pistil oblique sur son gynophore ; tout rappelle dans cette admirable plante le port et le feuillage des Swartziées, avec les fleurs presque régulières des Casses. Mais si ces traits extérieurs annoncent une légumineuse ; des capsules à cinq valves polyspermes trahissent bien vite les vraies affinités de la plante ; et quoique l'idée d'un *Godoya* à feuilles pinnées ne se fut jamais présentée à l'esprit, par la vue de l'espèce type, il faut bien admettre dans le genre cette remarquable modification de structure, qui promet de jeter un nouveau jour sur les affinités de l'ordre entier. Mais avant d'aborder

la question sous ce point de vue, notre attention doit se fixer quelques instans sur la plante des Amazones, décrite sous le nom de *Godoya gemmiflora.*

Au lieu de feuilles coriaces, planes, dentées et marquées à intervalles, de fortes nervures secondaires, nous trouvons ici à ces organes, une substance mince et fragile, un bord très entier légèrement roulé en dessous, et des nervures transversales parallèles, tellement fines et rapprochées, qu'elles rappellent exactement celles des *Elvasia.* Autour de la base d'insertion de la feuille, l'épiderme lisse et mince du rameau est remarquablement soulevée, comme si le pétiole était greffé dans le bois, par une cicatrice artificielle. Un peu au-dessus de cette aréole d'insertion, deux très petites écailles triangulaires, étroitement appliquées contre l'épiderme dont elles ne semblent être qu'une portion soulevée, peuvent à cause de leur position constante être regardée comme des stipules ; et, pourtant, ces organes sont parfaitement isolés du pétiole, et l'on ne saurait méconnaître leur analogie avec ces écailles qui, sans affecter un ordre apparent sur la partie feuillée des rameaux des *Godoya* et des *Cespedesia,* passaient, par intervalles, de l'état de stipule à celui d'écaille gemmaire, de bractée et même de foliole calicinale. L'inflorescence du *Godoya gemmiflora* consiste en grappes terminales peu nombreuses, le plus souvent simples, et les pedicelles réunis de trois à cinq dans l'aisselle d'une bractée subulée, font un angle presque droit avec l'axe primaire. Le calice offre toute l'apparence d'un bourgeon. Des dix écailles qui le composent, les cinq externes peuvent se décrire comme des bractées, quoique l'analogie seule fasse réserver aux cinq autres le nom de pièces calicinales. Toutes ont leur base interne également nue, et ne s'écartent que pour se détacher du réceptacle. Cinq pétales jaunes, très étroits, une rangée de filaments subulés placée entre ceux-ci et l'androcée fertile; dix anthères linéaires fusiformes, dont le bec terminal s'ouvre par deux fentes très courtes ; un ovaire légèrement excentrique dans la fleur ouverte ; tels sont les caractères que l'excellente figure publiée par les auteurs de l'espèce, fait

saisir à un premier coup d'œil, mais que j'ai dû rappeler ici, pour les contraster avec ceux du *Godoya obovata.* J'ai insisté d'abord sur les différences de leurs feuilles; qu'on les combine avec celles des organes floraux, et l'on admettra que la plante des Amazones, quoique très voisine des *Godoya*, mérite d'en être distinguée comme genre. Nous la désignerons dans la suite de ce travail sous le nom de *Blastemanthus.*

Au milieu des modifications diverses, qui fixent dans trois genres distincts les éléments hétérogènes d'un seul, on risque d'avoir perdu de vue les traits communs, qui les unissent en un même groupe naturel. Ces traits peuvent se résumer en quelques mots : Etamines insérées sur l'entre nœud assez distinct qui s'étend des pétales à l'ovaire; Anthères linéaires, tétragones, articulées avec leurs filets, ouvertes au sommet par des pores ou de courtes fissures, et plus ou moins dejetées sur un seul côté de la fleur ouverte. Ovaire oblique sur son court gynophore, et par suite excentrique dans la fleur. Valves de la capsule polysperme séparées par une déhiscence septicide; graines menues, à *testa* scobiforme ou dilaté en bord membraneux. Embryon droit dans un albumen charnu. Qu'on ajoute à ces caractères un port élégant, des feuilles alternes, luisantes, remarquables par leur nervation, et, les mêmes pièces scarieuses revêtant, par nuances à peine sensibles, la forme de stipule, bractée, ou sépale; on se trouve avoir fait avec les seuls éléments de l'ancien genre *Godoya*, un tableau qui s'applique trait pour trait aux *Luxemburgia* au Brésil.

Les charmants arbustes qui composent ce dernier genre, sont représentés en miniature, par certains *Lavradia* ou *Sauvagesia* des mêmes régions. Aussi, l'ingénieux botaniste, qui traçait sur les lieux l'histoire des *Sauvagesiées*, dut saisir entr'elles et les *Luxemburgia*, un degré de parenté plus intime qu'avec aucun autre représentant de sa flore. Les *Godoya* du Pérou étaient alors et sont restés à peine connus : en sorte, que pour reconnaître en eux les alliés les plus immédiats des *Luxemburgia*, il fallait, comme M. Martius, trouver dans une plante des Amazones, un lien évident entre les beaux arbres

du Pérou et les élégants arbustes de Minas Geraës. C'est donc à MM. Martius et Zuccarini qu'appartient l'honneur de cet heureux rapprochement ; et si leur idée n'a pas trouvé cours dans les ouvrages classiques, c'est sans doute parce-qu'elle est trop indirectement émise, parmi des observations qui réclament toutes une grande part d'intérêt. Ainsi rattaché à quelques formes analogues, le genre *Luxemburgia*, à raison du nombre de ses espèces, et comme étant parfaitement décrit, mérite de donner son nom au groupe dont il fait partie. Mais, ce groupe sera-t-il un ordre nouveau, ou bien, viendra-t-il se fondre dans une famille déjà définie ? C'est une question qui doit avant tout être examinée.

Un axiome que Linné a formulé pour le genre et qui, du moins en théorie, est reconnu vrai pour les familles, c'est que nos caractères écrits n'ont jamais fait l'une ou l'autre de ces associations. Ce n'est pas à créer, mais à découvrir des rapports naturels, que tous nos efforts doivent tendre. Et pourtant, cette harmonie de formes qui indique presque toujours l'affinité, est mille fois sacrifiée à telle ou telle idée préconçue de l'importance exclusive d'un caractère. On raisonne beaucoup sur l'affinité et l'analogie ; on admet sans peine que certaines causes générales reproduisent un *habitus* analogue chez les plantes des groupes les plus divers ; mais, on oublie trop que les modifications de chaque organe se présentent également chez les divers groupes, avec cette vague tendance vers des séries parallèles, que des lacunes dans nos idées nous empêchent d'embrasser d'un coup-d'œil. Ces réflexions qui ne prétendent nullement à la nouveauté, seront, j'espère, pleinement justifiées par ce qui va suivre.

Le nom seul d'Ochnacées rappelle cette remarquable modification du fruit que De Candolle a désignée par l'épithète de *gynobasique*. Bien loin, cependant, d'être particulière à cette famille, on a vu cette déviation de structure affecter également tous les types d'organisation des fruits, et se présenter chez les groupes les plus éloignés, sans s'étendre pour-

tant à tous leurs genres. Si l'évidence nous force à réunir dans la même famille, les *Pavonia* ou les *Malope* à loges monospermes gynobasiques, et les *Abutilon* à capsules polyspermes et à columelle le plus souvent très développée; pourquoi les loges gynobasiques des *Ochnacées,* isoleraient-elles ces plantes de toute autre famille, à laquelle le reste de leur structure les rattache? Pourquoi ne pas chercher des genres à capsules polyspermes, qui soient par rapport aux Ochnacées, ce que les *Abutilou* sont aux *Pavonia* ou aux *Malope?* Ces genres existent, en effet; ils se sont groupés dans les pages précédentes, autour du *Luxemburgia;* et, si le passage des Luxemburgiées aux Ochnacées propres, paraissait encore trop brusque; une plante qui me reste à mentionner, viendra justement combler l'intervalle entre les deux.

En publiant dans les *Icones* de Sir W. J. Hooker une figure de l'*Euthemis leucocarpa*, W. Jack, j'insistai sur les rapports que ce beau genre asiatique, jusqu'alors rattaché aux Ochnacées, présente avec les *Luxemburgia* du Brésil. Un port élégant; des feuilles, à dents courbes et presque cartilagineuses; un beau réseau de venules placé entre des nervures parallèles; des stipules ciliées et caduques; des sépales également fimbriés; des anthères presque sessiles, alongées, tétragones, ouvertes au sommet par deux pores confluents; tous ces caractères appuyaient le rapprochement des deux genres. Cependant, l'*Euthemis* présente sous un péricarpe charnu, cinq loges à parois fibreux, ou l'avortement constant d'un ovule ne laisse qu'une graine suspendue et à radicule supérieure. Il y a loin, sans doute, de ce fruit à la capsule polysperme des *Luxemburgiées*, ou même aux carpelles gynobasiques des *Gomphia*. Mais cet intervalle est comblé en grande partie, si l'on songe que l'ovaire de l'*Elvasia*, genre qu'on ne saurait méconnaître pour une *Ochnacée*, ne conserve de la structure presque générale de cette famille, que des loges monospermes à ovules ascendants, sans autre chose qu'une tendance vers la structure gynobasique. Il faut donc se garder de séparer ce que la nature a uni, d'après les nuances

légères qui rattachent évidemment l'une à l'autre les modifications extrêmes d'un seul organe.

D'après les considérations qui précèdent, le groupe des Ochnacées renfermerait trois sections naturelles dont voici les noms et les caractères.

1. Luxemburgiées : ovaire excentrique; capsules polyspermes; graines menues et pourvues d'albumen.
   Genres : *Luxemburgia, Godoya, Cespedesia, Blasthemanthus.*
2. Euthémidées : Baie à cinq loges fibreuses, monospermes par l'avortement d'un des ovules; graines anatropes suspendues; embryon droit dans un albumen charnu.
   Genre unique : *Euthemis.*
3. Gomphiées : Ovaire et fruit à loges monospermes, le plus souvent gynobasiques ; direction des ovules ascendante dans ce dernier cas ; à peu près telle dans l'*Elvasia calophylla*, où la base du style est plus élevée que le sommet des loges proéminentes; presque horizontale dans l'*Elvasia Hostmanni*, où la saillie des loges est à peine marquée.
   Genres : *Ochna, Elvasia, Gomphia.*

On voit que j'exclus de cette dernière section qui est proprement la famille des Ochnacées de De Candolle, les genres *Walkera*, Schreb., et *Castela*, Turp. Le premier n'a probablement d'existence que dans les livres. Il est basé, quant à la fleur, sur une figure grossière et incorrecte de l'*Hortus Malabaricus*, et, quant au fruit, sur une des rares erreurs qu'on doit pardonner à Gærtner. Je crois, en effet, avec MM. Wight et Arnott, que les deux autorités de ce prétendu genre ne sont pas autres que le *Gomphia angustifolia*, Vahl, espèce commune à Ceylon et à la côte de Malabar, à laquelle Rheede a donné cinq étamines au lieu de dix; tandis que Gærtner, sur des échantillons imparfaits du fruit, a renversé la vraie direction de la radicule. On trouve, en effet, dans sa figure, la forme assez particulière des carpelles du G. *angustifolia*, le *Wal-kæra* des natifs du pays, nom que Gærtner applique à la plante dont il a dessiné les fruits, et sur

lequel le même botaniste qui s'appropria d'un trait de plume toutes les découvertes d'Aublet, se trouve avoir établi, à son insu, un de ces noms *barbares*, auxquels il avait déclaré une chasse si active. MM. Wight et Arnott à qui l'on doit ces observations d'étymologie, proposent de conserver le nom de *Walkera* pour l'espèce Américaine que De Candolle a rapporté à ce genre, en rappelant par ce nom les services qu'une aimable personne a rendus à la botanique et en particulier à la flore de Ceylon et de l'Inde supérieure. Malheureusement on ne saurait conserver un genre sur une simple phrase spécifique, et d'ailleurs, le seul caractère de *pétales coriaces* que De Candolle donne à sa plante Américaine, serait une anomalie presque inespérée parmi les Ochnacées véritables. Le second genre dont il me reste à parler est le *Castela* de Turpin. Sa présence à côté des *Gomphia* pourrait se concevoir à peine, sans l'influence de cette première idée qui fait des Simaroubées un ordre à peine distinct des Ochnacées. Et cependant, les caractères de l'une et l'autre de ces familles sont trop bien connus pour qu'on ait droit de les séparer par un grand intervalle, au lieu de confondre leurs éléments respectifs. Il suffit de rappeler l'amertume, les fleurs dioiques, les ovaires libres, les ovules suspendus et les graines à radicule supérieure du *Castela*, pour prouver l'affinité de ce genre avec les Simaroubées. D'autres détails sur ses caractères ont déjà trouvé place dans la revision que j'ai publiée de cette famille.

Le désir de rendre aussi complète qu'il m'est possible avec le secours d'une riche collection la connaissance du groupe dont je viens d'esquisser les traits saillants, m'a conduit à une détermination laborieuse des espèces décrites, afin de faire connaître comparativement celles qui m'ont paru nouvelles. Je ne donne pas le résultat de ce travail comme une monographie. J'ai voulu seulement résumer sous une forme descriptive les observations éparses dans les pages

précédentes, dans le but surtout de nous préparer à traiter des affinités de la famille; tandis qu'une liste raisonnée de ses espèces devait indispensablement précéder toute observation générale sur leur distribution géographique.

OCHNACEÆ.

Ochnaceæ, DC. *Ternstræmiacearum et Sauvagesiearum, Gen. auct.*

Flores hermaphroditi, proportione 5-naria. Folia calycina libera v. ima basi vix connata, æstivatione imbricata. Petala libera. Stamina 5-10 v. indefinita, gynophoro brevi inserta, non raro in flore expanso secunda. Antheræ elongatæ, cum filamenti apice articulatæ! sæpius transverse rugulosæ, apicem versus poris v. rimulis 2 rarius in unam confluentibus apertæ.

Arbores v. frutices; (paucissimis exceptis, tropicales). Folia alterna, rigida, nitida, sæpissime pulchre lineato-nervosa. Stipulæ, perulæ, bracteæque scariosæ. Lignum durum, materia subresinosa astringente scatens. Pedicelli supra basim v. medium articulati. Flores speciosi fere semper flavi.

SECT. I. LUXEMBURGIEÆ.

Stamina indefinita v. rarissime subdefinita. Antheræ sub anthesi secundæ. Stigma sessile. Capsula plus minus complete 3-5 locularis, valvis septicide disjunctis, secus margines introflexos intus seminiferis. Semina numerosa, minuta, anatropa, sæpe compresso alata. Embryo in axi albuminis parci carnosi rectus.

Arbores vel frutices Americæ australis tropicæ.

Gen. I. LUXEMBURGIA, A. St. H., Endl. gen. pl. n. 5052.

Calyx deciduus. Antheræ subsessiles in massulam secundam sæpius coadunatæ, lineari-tetragonæ, apice summo biporosæ. Ovarium trigonum, incomplete triloculare. Semina compresso-alata.

Frutices Brasilienses, glaberrimi, ramis inferne denudatis, ramulis fastigiatis. Folia conferta, pulchre lineato-nervosa, serraturis incurvo-adpressis sphacelato-mucronulatis v. setiferis ornata. Racemi simplices, sub anthesi terminales, fructiferi alares.

Sp. I. Luxemburgia *ciliosa*, Mart. et Zucc. nov. gen. et sp. vol. 1, p. 41.

HAB. in campis districtus Adamantium, *Martius*. In montibus Organensibus, altit. 4000-5000 ped.—*Gardn.* n. 5677.

2. L. *speciosa*, A. S. H. pl. rem. Bras. et Par. p. 333, tab. 29.

In montibus prope *Milhoverde*, 5 leuc. a vico *Tejuco* Adamantium, alt. circit. 3,700 ped.—*A. S. Hil.*; prope *Itambe*, prov. *Minas Geraes*, *Gardn.* n. 4411.

3. L. *corymbosa*, A. S. H. l. c. p. 335, tab. 30.

In jugis altioribus montium dictis *Serra da Caraça*, altit. circit. 6000 ped. *A. S. Hil.*

4. L. *angustifolia*, nov. sp.

L. foliis angustis, basi longe attenuata in petiolum brevissimum decurrentibus, breve mucronatis; stipulis confertis, subulatis, hinc inde filamentosis; racemo (florifero) terminali, foliis longiore, conferte multifloro; articulo superiore pedicelli inferiore 4-plo longiore; foliolis calycinis integerrimis; antheris numerosis in massam ovatam antice non concavam conglutinatis.

Frutex 10-pedalis (*Gardn.*) Rami, more generis, inferne denudati, stipulis semi-destructis, lenticellisque magnis, punctiformibus, albis exasperati. Folia ad apices ramulorum valde conferta, erecto-imbricata, 2½ poll. longa, vix 2½-3 lin. lata, ima basi integra, et ciliis 1-2 longiusculis utrinque aucta, apice mucronulata, marginibus plana; serraturis crebris, incurvo adpressis, intus sub apice glandulosis. Racemi floriferi vix 2½ poll. longi, pedicellis (saltem inferioribus), ultra-pollicaribus; articulis (pedicellorum) superioribus, sub fructu, versus apicem incrassatis, deciduis; inferioribus, secus axim racemi tunc alarem, diu persistenti-

bus. Bracteolæ ad pedicelli articulationem 2, oppositæ, stipellatæ. Flores majusculi. Foliola calycina obtusissima, enervia, integerrima. Staminum massula ovata, seriebus staminum concentricis ex ambitu ad centrum in conum sensim elevatis. Ovarium massulæ staminum subæquale.

HAB. In fruticetis convallium district. Adamantium, prov. *Minas Geraes.*— *Gardn.* n. 4412.

Cette belle espèce, par son port, ses feuilles étroites et ses stipules, se rapproche du L. *corymbosa*; mais elle en diffère par ses fleurs en grappe alongée, et surtout par ses folioles calycinales très entières.

6. L. *polyandra*, A. S. H. in Mém. du Mus. 9, p. 351.

HAB. In parte prov. *Minas Geraes* quæ dicitur *Minas novas* A. S. H.

7. L. *octandra*, A. S. H. in Mém. du Mus. vol. 9, p. 351. *Plectanthera floribunda*, Mart. et Zucc. nov. gen. et sp. 1. p. 40, tab. 26.

HAB. In variis locis prov. Minas Geraes, prope *Ibitipoca*, *S. Joao del Rey*, *Villa Rica*, in montibus *Serra da Caraça*, *A. S. Hil.* in Monte prope *Itacolumi*, *Villa Rica*,—*Martius*; prope *Morrovelho*, *Gardn.* n. 4410.

Gen. II. GODOYA, Ruiz et Pav. prod. p. 58, tab. 11. (excl. sp.)

Char. reformat.—Calyx 5-phyllus, foliolis scarioso-squamaceis, intus seriem fimbrillarum foventibus, caducis. Petala 5, obovata, æstivatione quincunciali convoluto-imbricata. Stamina 10-20 fertilia, antheris eleganter incurvis, sub anthesi unilateraliter dejectis, lineari-tetragonis, apice poris 2 minutis, pollen fundentibus, lævibus s. transverse rugulosis. Ovarium supra stipitem brevissimum paulo deflexum, lineari-oblongum, apice subincurvo rostratum, 5-loculare, placentis axilibus, pluriovulatis. Stigma sessile, minutum, obsoletissime 5-lobulatum. Capsula 5-locularis, valvis demum septicide disjunctis, e fibris columellæ

in fila 10-solutæ pendentibus, navicularibus, antice hiantibus parte dorsali angusta, marginibus introflexis, hiantibus, in longum uniplicatis, intus seminiferis. Semina creberrima, minuta, compresso-subulata. Embryo?

Arbores Peruvianæ et Novo-Granatenses, sylvicolæ, proceræ, pulcherrimæ. Rami et inflorescentia, bractearum perularumque lapsu præcoci, annulato cicatrisati, lenticellis discoloribus, punctiformibus crebre conspersi. Folia nunc simplicia, obovato-oblonga, subsessilia, basi æquali cuneata, integerrima, cæterum grosse serrata; nunc *imparipinnata!* foliolis brevissime petiolulatis, a basi obtusa subinæquali ad apicem usque serratis. Racemi terminales et axillares sæpius in paniculam vastam digesti; pedicelli flore breviores, basi articulata caduci v. tenaciter persistentes. Flores speciosi, calice gemmiformi, caduco, petalis recentibus forsan candidis, siccitate carneis v. flavescentibus.

Subgen. Eugodoya.

* Stamina 10; antheræ læves; folia simplicia (rectius unifoliolata?).

Sp. 1. Godoya *obovata*, Ruiz et Pav. l. c. et Flor. Peruv. icon. ined. vol. 5, tab. 378.

G. foliis obovatis; racemis pedicellisque ante anthesim ebracteatis; capsula (ex R. et P.) cylindraceæ, basi obtusa, subsessili.

Frequens in nemoribus *Messapata, Macora, Cuchero* et *Iscutunum—Ruiz et Pav.*

Sp. 2. G. *Antioquiensis*, nov. sp.

G. foliis obovatis; racemis terminalibus subsimplicibus; pedicellis sub anthesi bibracteatis (bracteis tamen deciduis); capsula lineari-oblonga, utrinque attenuata. Tab. XXI. XXII.

Arbor priori simillima; folia tamen majora, 3-4 poll. longa, dimidio lata; serraturis plane adpressis, sphacelato-mucronulatis. Flores expansi diametro circiter 3-pollicari; petala obovata, membranacea, siccitate flavescentia.

Summos montes provinciæ Antioquiæ, regni Novo-Grana-

tensis, adornat. *Purdie in Herb. Hook.* Aug. flor. et fruct.

Obs.—La première partie de cet article était déjà sous presse, lorsque un nouvel envoi de M. Purdie a enrichi l'herbier de Sir W. Hooker de cette magnifique espèce de *Godoya*. Je regarde cette circonstance comme d'autant plus heureuse, qu'elle me permet de constater la structure des anthères des espèces à feuilles simples. Elles sont, ici, à peu près droites et lisses, tandis que dans l'espèce à feuilles composées, elles sont courbées et marquées de rides transversales. Ces différences jointes à celles de leur nombre sembleraient autoriser la formation de deux genres, et exigent, au moins, celle de deux sous-genres bien distincts. J'adopte ce dernier point de vue, en attendant que la connaissance de nouvelles espèces décide définitivement la question. J'observe cependant, que le pétiole des espèces à feuilles simples présente un bourrelet circulaire assez épais, qui tendrait peut-être à indiquer une articulation, et, par suite, à rendre moins brusque le passage aux feuilles composées.

Le *Godoya Antioquiensis*, suivant l'observation de M. Purdie, fournit un bois de construction extrêmement durable, et fait d'ailleurs l'ornement des hautes montagnes de la province d'*Antioquia*. Son nom vulgaire est *Counso*. Le G. *obovata*, R. et Pav. nommé *Laupe* par les Espagnols du Pérou, est employé à des usages analogues.

Fig. 1. une anthère légèrement grossie ; *fig.* 2. capsule de grandeur naturelle.

Subgen. 2. Rutidanthera.

** Stamina 18-20 ; antheræ transverse rugulosæ ; folia imparipinnata.

Sp. 3. G. *splendida*, sp. n. Tab. XIX. XX.

G. foliis cum impari-4-jugis ; foliolis ovato-ellipticis basi obtusis, serratis ; panicula terminali, floribunda, sub anthesi ebracteata ; capsula ovato-oblonga, acuminata. Rami crassi, cortice griseo-fusco, ruguloso, lenticellis crebris exasperato, vestiti. Folia 1-½ ped. longa ; petiolus communis

gracilis, subteres, in longum tenuiter striatus; partiales breves in communem vix decurrentes. Foliola cum impari-4-juga, inferiora regulariter opposita, paris supremi inter se et cum foliolo terminali inæqualiter basi confluentia. Limbus 4-5 poll. longus, 2 poll. latus, folium *Castaneæ vescæ* aliquomodo referens; textura rigida, fragili; facie supera minus lucida quam illa foliorum G. *obovatæ,* inter nervos non prominentes vix conspicue venulosa; infera pallidiore nervis elevatis, venisque intertextis, percursa; serraturis adpressis, intus sphacelato-mucronulatis. Stipulæ in specimine florido desideratæ. Panicula folio supremo parum brevior, basi simplex, nuda, ramis epidermide nitida vestitis, citissime ebracteatis. Sepala exteriora late obovata, subtruncata, emarginata, flabellatim striato-venosa, interiore longiora et subacuta. Flores expansi diametro circit. 2-pollicari. Antheræ eleganter incurvæ, transverse rugulosæ. Capsula matura vix 1 poll. longa.

HAB. In sylvis Novæ Granatæ, prope pagum *La Cruz,* Prov. *Monpax*; *Purdie in Herb. Hook.* Floret August.

Fig. 1. Une des écailles extérieures du calice, vue en dedans, pour montrer la série de corpuscules cylindriques qu'elle recouvre; *fig.* 2. l'ovaire légèrement grossi; *fig.* 3. capsule de grandeur naturelle.

Memoir of the Life of* DR. J. R. T. VOGEL; *by* L. C. TREVIRANUS.

(*To be followed by Dr. Vogel's Journal of the Voyage up the Niger, under the command of Capt. Trotter, R.N. and by a description of the plants of this country.*)

Amongst the numerous sacrifices consequent on the unfortunate expedition to the Niger, science is not without her peculiar loss. Whatever reliance may be placed on wealth

* Translated from the German in the Linnæa, v. 16, 1842, by the Rev. M. J. Berkeley.

and a careful choice of means, it must be admitted that little has been accomplished by the numerous and deeply calculated plans for obtaining a more perfect knowledge of the interior of Africa. Amongst many others, one of the naturalists of the expedition, to whose memory the following pages are dedicated, has succumbed to the destructive influence of the climate. If, however, according to the expression of a philosopher, it be the province of eloquence to commemorate illustrious minds, whose labours, owing to an unfortunate concurrence of circumstances, have not been productive of commensurate effects, and so, to compensate* for the want of incident, a more skilful pen than mine is requisite. I must be contented to show what the world and what science have lost, by the simple relation of a few circumstances, and by extracts from the last official records of the deceased.

Julius Rudolph Theodor Vogel, or as he frequently called himself by an abridgement of his baptismal name, Theodor Vogel, was born at Berlin, on the 30th of July, 1812. While yet a boy, he showed a decided inclination for the study of history, geography, and the productions of nature. No book was read by him with greater delight than Robinson Crusoe. He knew it almost by heart, and in all probability its perusal awakened in him that eagerness to visit countries yet unexplored by science, which was hereafter destined never to leave him. He received his first scientific education at the Friedric-Wilhelms-Gymnasium at Berlin, of which Spilleke was then the director, from which establishment he was dismissed with the testimonial No. I. The Gymnasium, however, afforded no opportunity of acquiring botanical knowledge, but under the guidance of Ruthe, upper master of the Gewerbschule, he commenced studying and collecting plants. With him he went as a pupil in summer weekly to botanize, and if he had leisure for a day or two, it was devoted to more distant excursions. At the beginning of the summer term, 1832, Vogel was a student at the university of Berlin, where he attended the philosophic and hu-

* F. Hemsterhuis, Œuvres philosophiques, I. 268.

manity lectures, but more especially those of Natural History. On the 5th of August, 1837, he was made Doctor of Philosophy; the subject of his inaugural thesis, which has also been published by the booksellers, being a synopsis of the genus *Cassia.* The year after, he qualified himself as Private Tutor at the Berlin University in the botanical department, and in the first half of 1839, exchanged his situation for a similar one at the University of Bonn, aided by a government allowance, in consequence of which he was obliged, at the same time, after the death of Professor F. Nees von Esenbeck, to perform the duties of his office. During the latter part of his academical course, and after its completion, Vogel turned his attention principally to descriptive botany, for which the collections at Berlin, especially of Brazilian plants, furnished rich materials.

His talents were peculiarly applied to Leguminous plants. As early as the year 1837, four treatises by him appeared in the eleventh volume of this Journal: "*De Swartzeis observationes,*" "*Dalbergiearum genera Brasiliensia,*" "*De Cæsalpineis Braziliæ,*" and "*Synopsis generis Cassiæ pars altera.*" In these, several new genera are proposed, numerous new species are briefly but characteristically described, and many already known have received important corrections. In the year 1838, in conjunction with Dr. Schleiden, he published some greater and lesser treatises, which, for the most part, have reference to the same family, in the 19th vol. of the *Actæ Acad. Nat. Curiosorum,* entitled "Contributions to the history of the development of the parts of the flower in the *Leguminosæ*, and on the Albumen, especially of *Leguminosæ,*" both accompanied by numerous illustrations; and in the 46th of Poggendorf's *Annalen der Chemie und Physick,* on "*Amyloid, a new vegetable substance.*" At the same time appeared, in the 12th volume of Linnæa, a continuation of his labours on the leguminous plants of South America, namely an Essay on Brazilian *Hedysareæ.* In the year 1839, also, he continued his task with his wonted perseverance, and in the 13th volume of *Linnæa,* we find two treatises

connected with it, viz.: on Brazilian *Vicieæ*, and observations on American *Bauhiniæ*. In 1840, he received, for investigation, the *Leguminosæ* collected by the late Prof. Meyen, in his journey through Brazil, Peru and China, and the results of this labour appear in an Essay in the supplement to the 19th volume of the *Actæ Acad. Nat. Curios.* The 15th volume of *Linnæa* contains three of his treatises; viz. Remarks on the existence of *Amylum in Cryptogamous plants*; Additions and Corrections to the Synopsis of the Genus *Cassia*, and Remarks on some species of the genera *Thymus* and *Origanum*. There is also in Bechner's "Repertorium für die Pharmacie, 1840," a Review of the species of the genus *Origanum* and a Description of *Thymus coriaceus*. Mr. Marquardt found this undescribed species of *Thymus* in many apothecaries' shops and collections of *materia medica*, amongst stores of *Origanum Creticum*.

As Vogel's position in Bonn rendered a perfect knowledge of the plants in its neighbourhood requisite, preparations were commenced for a Flora of Bonn, to which he devoted much time, and for which he undertook many excursions. In August, 1840, he made acquaintance with a member of the African Civilization Society, which had arisen in London under the patronage of Prince Albert, with the view of extending civilization amongst the natives of Western Africa, and putting an end to the slave trade, who chanced then to be at Bonn. The British Government fitted out three steamers,* destined to run into the Niger, or Quorra, at its entrance into the Bight of Benin, on the western coast of Central Africa, to penetrate by this vast navigable river, into the interior of this little-known country, to make treaties with the inhabitants, and to establish an emporium at some suitable place. A Botanist was needed, to ascertain the vegetable productions of the country and the capabilities of the soil, and Dr. Vogel was found willing to hold this office, hoping by these means to satisfy his eager desire to explore a rich and almost unknown vegetation. He undertook, there-

* The Albert, the Wilberforce, and Soudan.

fore, in September and October of the same year, a journey to England, to make a personal acquaintance with the committee of the society; returned for a few weeks to Germany, to arrange definitively his affairs, and finally left Bonn on the 2nd of December, 1840, to enter upon his journey, having obtained from the proper authorities a two years' leave of absence.

The departure of the expedition, which, according to the first plan, was to be in the end of January, 1841, was deferred from various circumstances and impediments, to the third week in May; when, finally, the ships left Plymouth harbour and Europe, Dr. Vogel embarking in the Wilberforce. During his four months' residence in England, Vogel prepared himself in every possible way for his new destination, and in the parts for March and July of a journal entitled "The Friend of Africa," he published an "*Essay on the Botany of Western Central Africa*," in which the hitherto written treatises on the vegetable productions of this part of the world, were reviewed. From Madeira he addressed letters to his relations and friends in Europe; but they never reached their destination. From Sierra Leone he wrote on the 30th of June, as follows:

"We sailed from Madeira by Teneriffe to St. Vincent, one of the Cape de Verd islands, and from thence here. At Teneriffe we remained a day, but I was able to take only a cursory glance, since I was unwell on the passage from Madeira thither and did not venture to leave the ship. We remained a fortnight off St. Vincent; the island is small, but has an excellent harbour, and was therefore the rendezvous of the ships belonging to the expedition. Anything more comfortless than the view of this island, I never beheld; one might believe that after the formation of the world, a quantity of useless surplus stones was cast into the sea, and that thus the Island of St. Vincent arose. There is nothing but hills and mountains (some of them 2500 feet high), with small valleys, which in the broader parts are very sandy, without a plant deserving the name of tree; while the

vallies themselves produce scarcely a species; for in my first excursion I found in four hours only two species, of which one, a lavander, was completely dried up. What had been wanting here, namely moisture, was in a few days but too abundant. On the part of the coast where we are at present, the rainy season has begun, that is the first portion of it, which announces itself by single thunder-storms with violent wind (tornados.) Sometimes on the passage my cabin got very wet, and what was worse, my plants. Since we have been here, the weather is generally clear by day; but towards evening there comes heavy rain or a thunder-storm, and last night we had one, such as I never witnessed before.

" On entering the river at Free Town, the shore, on which the town stands, is bordered at a short distance by a range of hills, which make a very pretty appearance with their gentle swelling summits and insolated lofty trees. A rich vegetation stretches from the shore upwards, which captivates the eye by its soft bright green, such as is only seen in the tropics, and gives to the whole an incomparably charming character. I rushed eagerly into these woods, and much regret that the short time of our stay did not permit me to do more, for we were obliged to proceed. The object of the colony here is to teach the Africans active habits and to christianize them; there are, I think, above 40,000 in the colony, and many of their villages are built close to the town; so that, for miles, there is no cultivation. Since we left St. Vincent, the temperature has been nearly the same. The thermometer there was generally 81° Fahr. in my cabin; here it is about 84°, and sometimes in the middle of the day reaches 86°. This heat is not greater than with us in summer; but the slighter refrigeration of the atmosphere by night, and the power of the sun, make it seem often more intense than it is. An awning is spread over the deck, under which, when there is a breeze, it is always cool. I am very comfortable on board, except when my collections are lying about. When I return laden with plants, I have no where to prepare them; and when they are dry, the

damp insinuates itself to such a degree, that I am compelled to redry them. This is very troublesome; and on board a ship, especially a man of war, there is no especial place for preparing or preserving plants. I am quite a nuisance to my messmates when I unpack them, and so is the servant who announces breakfast, lunch, &c., for the table must be cleared. I must be off, and then I try to work on deck; but there the wind and rain attack me, so that I have to contend with all the elements. I am here quite amongst the negroes, for there are few white persons in the town, and during my excursions I frequently do not see one, during the whole day. I cannot, however, say that this seems altogether strange to me, for on our voyage outward, we had many black sailors in our ship, and their number has gradually been increased in the course of our progress."

From Cape Coast Castle roads, where the ships belonging to the expedition arrived on the 24th of July, Vogel writes as follows: "Our passage from Sierra Leone hither has been rather tedious. We set out from that port with but little fuel, and were therefore necessitated twice after we left Monrovia (Liberia), viz. at Grand Bassa and Cape Palmas, to cause wood to be felled, to enable us to proceed. Our voyage has been constantly along the coast, so that we have had ample opportunity for observing the remarkable nation of the Kroo, a people which dwell scattered along the coast, and often undertake long coasting voyages in small canoes. These canoes are built almost exactly in the same way as the little skiffs, which we called at Berlin Seelen-verkaufer; but made of a single piece only. The natives sit in them generally naked, they use broad oars and a very small rudder; and do not trouble themselves if the craft upsets, for they have commonly nothing to lose, and if they carry garments with them, they are soon dried. They have mostly a piece of cloth, bound round the head, which, when they come on board, they place round the loins, and think themselves full dressed with great ivory rings round the ankles, and belts or chains round the foot or arm. We had many

of their young people on board, for they are tolerably docile, and are therefore hired by the coasters, to perform such hard labours as are considered prejudicial to Europeans. When they have earned so much money by their voyage, as will enable them to buy one or more wives, they return home, establish the women, and leave them for a new expedition, until they get eight or ten more wives, who must support them, for all field labour, &c., is performed by females. Including these Kroos and other negroes, who are employed in various ways about the ship, we are now considerably more than one hundred men strong; frequently, therefore, when I have been for a time at that part of the vessel which they occupy and where alone smoking is allowed, and return to the quarter-deck where only the officers are, I feel quite relieved from the bustle. It is now the rainy season and we have had in Monrovia and Grand-Bassa a week of continued rain, during which the sky has been for many successive days as dark as it can be with us in autumn only. Besides, the African brooks, when they are swollen with rain, assume the privilege of making their way down the footpaths, and I was therefore obliged for hours to wade up to the knees in water. I was indeed, in general, whether at sea or on land, as wet as it was possible to be. One advantage accrued from the rain, it kept the decks water-tight, whereas before, I was regularly soaked by the water when they were washed at five o'clock in the morning, and frequently part of my collection got damaged. At Cape Palmas we arrived at a spot where an intermission of the rainy season takes place, and from thence to this place we have enjoyed delightful weather. The passage, however, was longer than we expected, so that water ran very short, and one day we were absolutely placed on half-allowance; otherwise we should scarcely guess that we were in a foreign zone. As regards meat and drink, we have several times a week salted beef or pork, and in general, other kinds of meat preserved in hermetically sealed cases. Hares, poultry, &c., preserved in this way, often appear at table. These ship-stores are

preferred to the fresh provisions which are presented to us on landing. My situation on board is very tolerable. The captain gives me as much liberty as possible; and I hope, when we have once arrived at the proper field of action, to meet with every encouragement from him. My health has been very good; and although there cannot but be some irksome hours to men shut up in a ship, I have yet, on the whole, felt happy and contented, and only look forward with impatience to the time when my own peculiar service will begin."

The next letter from Vogel was written from Accra, on the 4th of August.

"We remain here but a few days, so that I can acquire only a very superficial view of the vegetation of the coast. Real forests lie at some distance in the interior, that is, about thirty English miles—too long an excursion, even were it not desired that nobody should sleep on shore, for fear of the fever. Yet I have been twelve or fourteen miles into the interior, in the district of Aquafim, to inspect a Danish establishment. There was a geologist with me, and we were received by the Danish governor with the greatest civility. Such a journey on foot being considered too difficult for an European, large flat baskets, used here instead of sedan-chairs, were placed at our disposal, and four negroes to carry each basket. There were, besides, a number of negroes, to take charge of our luggage, so that our caravan amounted to seventeen persons, besides ourselves. At the coffee plantation there is a house, arranged with European accommodations, where we were surrounded with all the luxury of the civilized world, and had for dinner French asparagus. The spot was lovely, pleasantly varied with hill and dale, mostly covered with savannahs, where the grass is taller and stronger than in our own meadows, and between the tufts little bushes, instead of flowers. I think that I saw *Blighia sapida* in cultivation, and remarked that Schumacher mentions it under a name different from that by which it is known to the natives. The negroes who accompanied us on this

excursion were slaves, for the Danes still have slaves, but they seem well off, and were merry and cheerful beings. On the whole, I found in the short period of my acquaintance with them, no difference in their behaviour or dealing from the free negroes at Cape Coast Castle, except that the latter are shameless in demanding money for drink. At Cape Coast, it is absolutely necessary to keep an immoderate number of servants; and on an excursion from thence, our train of attendants consisted of thirty-six persons. There is no difficulty in this, for the blacks go as servants merely for food and clothing, which in this climate costs little; or they are sent as boys by their fathers to an European, that they may in this way learn something. The houses of Europeans here are very large, roomy, and well built, raised high above the ground to make them airy, and furnished with open verandahs for the same purpose. Europeans, however, do not in general remain long, since the climate on the coast is not suitable to their constitution. The few who are here seem to lead a miserable life; the society is very limited and monotonous, and their wishes confined principally to making money, in which many fail. At Cape Coast, the small white shells which we use for ornamenting horses' bridles, are given in exchange as coin; they are called cowries; a thousand of them are worth about a gueldre; in the interior they are worth more; we have with us whole sacks of them. Gold-dust also appears at first a very curious medium of exchange; it is used especially in Cape Coast and Accra, where it is washed from the sand of the river banks which flows through the town. Every one of the market people carries a small pair of gold-scales, with which he weighs out for a silver-groschen, or perhaps for a sechser, its worth of gold-dust; they then take these very small grains with them, wrapped up in a piece of rag. All these market people are natives, and sell palm-oil, cocoa-nuts, different kinds of fruit, fish, home-woven cotton, &c. The clothes of the men consist simply of a napkin round the loins; or in addition, a long piece of cloth passed under one arm

and over the other. They remove it from the shoulder, when they meet a white man and lay bare the heart by way of salutation. The women have these clothes also, and others in addition. The cloth round their loins is larger, and furnished behind with a monstrous bustle; the bigger this is, the more respectable is the woman, and the larger her family; in many it projects like a saddle. Little children are perfectly naked. So soon, however, as a young girl assumes a piece of cloth by way of clothing, it is furnished with a bustle, which with time is made gradually larger.

"Although I have at present had no opportunity of admiring the full splendour of tropical vegetation, yet many objects have fallen in my way which induced me to examine and to gather them. I regret very much that I have so many difficulties to overcome, in reference to my collections, from the scanty room on shipboard, and the humidity of the weather. If not attended to daily, everything is covered with mould, and even the paper in the chests becomes quite damp. Perhaps, after much pains, I am so fortunate as to get my plants dry, with the help of the sun and steam-engine; but I have still to look to them again, and often find cause enough for repeating the process. Notwithstanding all this trouble, the specimens are bad, they fall to pieces and mould continually, and I must sit down under the sorry consolation, that I have effected with all my zeal as much as circumstances would allow."

On the 9th of August, the little fleet, after it had directed its course from Accra straight across the Bight of Benin, reached that mouth of the Niger which is called Nun, and Vogel writes from thence on the day of arrival, as follows:

"Last night, without any remarkable wind, there was so strong a rocking of the ship, that I scarcely slept a wink. I was up late for the first time, namely, after eight o'clock, and was not present at the morning prayers, which a German Missionary, from Sierra Leone, the Rev. Frederick Schön, performs from half past seven to eight. Breakfast comes between eight and nine; to day we had ham and yams, and

as usual, coffee without milk. The atmosphere was so thick that we could often not see half a mile, though when there was for a moment a clear sky, we descried the mouth of a river, which we took for the Nun, therefore we anchored about six miles from the shore. The rain came down in torrents, and the whole of the gun-room was flooded. I betook myself to my cabin, from the window of which I let down the shutter, to enable me to see; but the cabin and bedding were soon so soaked from the entrance of the rain, that I was obliged to fly to the deck in my mackintosh. The awning is not waterproof, and the water stood in many places two inches deep; nevertheless, I tried to wile away the time there till dinner. This takes place between two and three, and, thanks to preserved meats, yams, pastry, &c., is very comfortable. Afterwards, the carpenter was in requisition to make my cabin water-tight. The window-shutter was closed and the bed dried, as well as circumstances permitted. The stove was again placed in the gun-room, so that we had the pleasant warmth of 87° Fahr. There was enough to occupy me till tea in putting my cabin to rights. At six o'clock we have tea, without milk, and sea-biscuit. At half-past seven, evening prayers. The rain having somewhat abated, my companion and I sought for a tolerably dry place, where wrapped in my cloak, I might smoke a cigar; and then I took a seat in the gun-room, where I am writing this letter. The violent rolling of the ship, however, still continues, and its effect is evidenced in my more than ordinarily bad writing.

"Aug. 12. We lie at anchor in the open sea, two or three miles off Cape Nun; a stately fleet, consisting of the three steamers, with a large transport and a small one, which will accompany us up the river. There is much to be done; the last stores are to be taken out of the transport, which leaves us here, and the ships supplied as much as possible with coal, that we may proceed up the Niger without delay, to its confluence with the Tschadda.

"Sunday, Aug. 15, P.M. At last we have run into the

Nun, after having endured, while at anchor, the most frightful swell, and at the same time scarcity of water. The expedition, in fact, commences to-day; after long delay, we are at length arrived at the place where our observations are to begin. The vegetation, when viewed from the ship, appears extremely luxuriant, and there is something like a forest. We shall probably remain some days in this place. I only hope that the rain will permit me to make good use of the time."

At length, on the 11th of September, the expedition reached the confluence of the Niger and Tschadda, and on the 18th of September, Vogel thus writes:

"We arrived a week since at this place, which I conceived I might consider as an occasional place of rest. We reckoned on a six days' course hither, with no delay at the mouth of the Nun; instead of this, from our first arrival at the Nun (on the 10th of August), to our coming here, a month has elapsed. At Aboh and Iddáh some days were spent, till the desired contracts against the slave trade were concluded with the kings. This stay was, however, little to my purpose, for circumstances hardly allowed me at either place to go on shore; and at the latter I was unwell, though not extremely so.

"At Iddáh, the country which was before low and flat, begins to be elevated and rises in mountains 2000 feet high, which, with occasional interruptions, extend to this place, where they are confined to the right bank of the river. Here and there, spots occur, which remind one of the Rhine; the bed of the river is, however, too broad (generally above half a mile) to be picturesque, and is often broken and enlarged by various islands. The mountains are bare, without any signs of human industry; once only I saw a village on the top of a hill, which appeared very pretty. Mount Patteh, in whose neighbourhood we lie, is a quadrangular mountain on the right bank, rising precipitously on all sides about 1200 feet high, with many patches of forest, and thickly clothed everywhere with plants. At its foot grow many slender *Oil-Palms*, so that the whole picture, painted

with the fresh green which the rainy season has produced, is very lovely. As I sit under the awning on the quarter-deck, and look towards that spot, I cannot help being pleased with the view, beholding in the solitary *Baobabs*, and the *Oil-Palms*, though familiar to me now for weeks, forms which still interest me from their novelty.

We have bought a piece of land on the right bank, extending from Mount Patteh to Beaufort Island, and at this moment are preparing a habitation for the person who is to have the charge of the station at the foot of the mountain. The land is decidedly of bad quality, and a better situation will be sought for; the other bank is far more suitable, but it has been rejected as too low; indeed, it is now under water. It is impossible for me, at present, to say any thing of the nature of the vegetation. We certainly have not here the usual exuberance of the tropics; perhaps, since I have been on the river, I have collected three hundred species. No single family gives a peculiar character to the vegetation, but this depends on a mixture of many families. Yet it is possible I may be deceived, for scarcely any trees at present are in blossom, many have only fruit, and others are without any characteristic organ. The *Baobabs* are abundant, most of them have the habit of old thick oaks, only they are perhaps proportionally lower, but I have met with none which has answered the expectation raised by Adanson and Golberry. Among Palms, the *Oil-Palm* alone is frequent along the river and in marshy places; the *Fern Palm* occurs here and there, and the *Cocoa* extends as far as Iddáh. I believe that I saw through the telescope a *Tree Fern*. *Parasitical Orchideæ* grow occasionally, though not commonly, lower down the river; here I have not met with one. A leafless *Euphorbia*, forming monstrously thick bushes, grows on Mount Patteh. *Lianes* are abundant, but their tree-like stems affect little the character of the landscape; they form, with the mother-stem, a thick vegetable mass. The most interesting are the towering and climbing herba-

ceous plants, which, especially along the shore invest the shrubs and trees to a great height, often forming real vegetable walls, adorned with the sparkling blossoms of *Convolvuli*, *Cucurbitaceæ*, and *Asclepiadeæ*. There is no fruit here adapted to European palates, the best is the *Hog-Plum*, which is worse than our *Sloes*, and its name indicates its quality. On the coasts there are good *Pine-apples*, *Bananas*, &c., but they are introduced; the latter alone are cultivated here, though rarely. Horses are very scarce and not larger than asses, and the oxen resemble sheep. Butter and milk are rarely or never procurable, the eggs which are brought are all set upon, we have nothing but old hens for poultry. Bearing these matters in mind, I cannot help exclaiming with Ovid:

'Heu terra felici non adeunda viro.'

The natives, who come to us from far and near, behave extremely well; they have never shewn the slightest sign of enmity, on the contrary, they are rather too confiding. They are not of that deep black hue which is observable in other Africans, and in this neighbourhood they have often very good features. They understand spinning and making cloth; they know how to work in iron, to manufacture knives, sabres, nails, &c.; they cultivate also the fields with some degree of skill. It is sad, however, to think, that they have possessed the same aptness for these arts, probably from an almost inconceivable time, without making any improvement; they want that spiritual energy, which renders every acquisition a step to further advancement. We have a daily market on the shore, whither the inhabitants of a neighbouring village resort in great numbers, to sell or barter what they possess. Small looking-glasses, framed in paper, meet with very ready purchasers, and I shall never forget the joy which beamed in the eyes of many, when they first beheld their own faces in a mirror. The women, especially, cannot be satisfied with gazing on them-

selves, smeared with the powder of a red wood and their short hair standing upright in little tufts, so that they appear more like horned devils than human beings. In general, however, they prefer what is useful to trifles, provided the latter be not too dazzling and enticing; as for instance, a bright red cap edged with gold.

"We brought with us a quantity of articles of female dress, often ornamented absurdly enough, as gauze handkerchiefs, sashes, &c., which they accept as presents with sufficient indifference, whereas they are very eager after large pocket handkerchiefs, which they wear round the loins. The men are all armed with bows and arrows. They value their arrows very highly, which are strongly poisoned; one of them, however, lately sold me all his implements of war, viz., arrows, quiver and bow, a short wooden arm-plate, a knife and an iron ring, for 2000 cowries, about a dollar and a half, which is however not above half the original price. All these things are made convenient for use, and strong, but generally without much art. The way they string their bow, which is about four feet long, is clever. In the right hand they hold a knife, with a hollow handle, through which they pass four fingers and the middle of the hand; on the thumb they have an iron ring, and draw between this and the handle the bowstring, so that they cannot injure the hand. Besides, they are ready, as soon as the arrow is discharged, to use the knife. There is a peculiar custom in the whole of Africa, called "dash." Before a person deals with a stranger, a present is given, called in African English, "dash." As the Africans expect that strangers or Europæans give far more than they receive, this system is a sort of indirect impost, and unpleasant to those who are not prepared for it, and I have seen many a silk handkerchief given away in this manner for nothing. The cotton ones, which I had bought, have done me good service in this way

"The weather has been very pleasant for travelling. The rainy season, which we have had in perfection, bestows at present only an occasional shower; I expect therefore that the

river, now at its heght, will soon begin to fall. The heat in the afternoon is generally up to 83° Fahr., seldom so high as 87° or 90°. At night it sinks to 76° or 74°, which feels very cold after the heat of the day. But the sun has peculiar influence here, especially when it bursts forth gradually after a gush of rain; it is then so burning, that I am glad to use an umbrella and a straw hat.

"The country we have so slowly examined, is pronounced unhealthy. It is no wonder then that the African fever, or rather fevers, kept in check during the journey itself by the excitement, has broken out most terribly, so that the ships are so many lazarettos. At present we have had few deaths; but what may take place, it is impossible to say, for no sickness is more deceptive, or undergoes quicker changes, than this fever. Before the evil proclaimed itself so loudly, the plan was as follows: One ship, the Wilberforce, was to go up the Tschadda—this is still to be done. The two other ships were to ascend the Niger, as far as Bussah or higher. If they could not proceed further, two great boats were to be manned, and, if possible, to reach Timbuctoo. Now, however, a plan is arranged for sending the smallest vessel, the Soudan, down the river, to convey the sick to Fernando Po. I think we shall be back here from the Tschadda in from four to six weeks, and since the rainy season will then be over, and I hope the alluvium on the shore so broad as to enable us to dwell there with comfort, I trust to be in fixed quarters and able to make wider excursions. Since being unwell a few days at Iddah, I have felt healthy and strong. The climate is, however, very injurious to an European constitution, and Sierra Leone also is considered unhealthy; I have, however, found myself quite well after strong exercise. I ascended Mount Patteh, which is about 1200 feet high, about six o'clock in the morning, without much fatigue; I was perfectly well, I botanized, returned at two, took my luncheon and rested. But the whole afternoon I found myself so extremely exhausted and incapable of doing the least thing, as I never was before; with this consolation,

however, that I did not experience the slightest feeling of illness. Every one of us, who is not sick, is plagued with itching on the skin, and eruptions; this affliction, together with the mosquitos, which, however, at present have not been numerous, do not let us sleep at night. In short, it is a wretched existence for a European."

The unhappy fate of the Expedition is too well known. Vogel writes on this subject from Clarence Cove, in the island of Fernando Po, on the 22nd of October; "We were desirous of proceeding farther, to begin a real voyage of discovery, when the tropical fever, which we had long feared, but at last considered as left behind, broke out with such a degree of virulence, that in a short time almost all the Europeans were seized, and most of them suffered severely. On the same evening on which I wrote my last letter (18th of September), I fell ill of the fever, which assumed a serious aspect. The sea air being considered the best remedy against the malady, we went all together down the river to this place. First, the Soudan with the sick; then our ship, the Wilberforce; and lastly, the Albert, after it had proceeded up the Niger for some days, was finally compelled to return, and to bring all the Europeans with her. It is now the intention of the conductor of the Expedition to sail to Ascension, which is considered peculiarly healthy, there to await the perfect recovery of the sick, and in March, when a better climate for a European constitution is expected, again to ascend the Niger. I heard that I might be allowed to spend the interval at this place. They brought me on shore in a very high fever, and I have been now almost three weeks here. The fever, which on my way was almost always upon me, has left me for the last week and a half, and I am now, as I believe, out of all danger. But my strength returns very slowly, and I shall scarcely be able for these six weeks to resume my botanical investigations. At present I cannot walk, but stumble over my own feet. One of the ships, the Wilberforce, is gone to Ascension; the Albert, which arrived later, is here, and will wait for the recovery of her sick."

"Of the Island of Fernando Po itself I can say little; I have not yet been in a condition to look round me. Yet it seems rich in plants, and I hope especially that the examination of the mountains may prove productive; for they are mainly covered with thick woods, and the highest point is above 10,000 feet high. The accommodations are but limited and poor. All the houses are merely made of boards, knocked together, and are raised on strong posts, which are obliged to be frequently renewed to keep off the vermin, and to facilitate the current of air. They are constructed, principally, with a view to airiness; the windows, that is the shutters, do not close; the roof is seldom water-tight, and in the walls and floor are great holes, so that during a heavy rain, such as prevailed yesterday, our chamber is almost flooded, and it is merely the holes in the floor which, allowing the water to escape, give some relief. The German Mineralogist, belonging to the Expedition, who is somewhat more advanced than myself towards recovery, will remain here, and we have clubbed together for our housekeeping; but even this is expensive. Anything in the shape of a kitchen is out of the question. To the open space under the house, which is beaten hard like a barn-floor, the cook brings every day his iron grate, and prepares, with a monstrous consumption of wood, in four or five iron pots, every thing that can be procured for food. There is, however, no great choice. We have fowls, and beef when ships come, but only then, and occasionally fish. Yams never fail, and they are excellent, so that I prefer them by far to our potatoes. What a pity that there is no possibility of introducing this plant at home! We can have them every day; indeed the poorer people live almost entirely upon yams. Add to this, rice, which however is not cultivated here; and it is almost all that the country can afford to set a poor invalid on his legs again; and it is little enough! If any thing else be wanted, it must be procured from Europe. For our domestic affairs, we are obliged to have two servants, of whom one is cook.

Each receives daily a shilling, so that the two cost above three pounds sterling a month, and we have to keep them too. Both together do not accomplish in a day half so much as one European would. Meanwhile, my life passes in eating, drinking and sleeping, for I am fit for nothing else, and am unfit even for that. The Expedition will go up the Niger again in March, and it is hoped will be in a condition to remain there till autumn; if so, we shall return at the end of next year to Europe. Should I regain my strength by the commencement of the dry season, and be able to devote so many months to this island, I expect to reap such a harvest as will content me for some time."

Vogel's last letter is from the same place, dated the 22nd of November, and is as follows: "Since I wrote last, there has been no great alteration. My recovery is tardy, but progressive; or, rather, I have been well for some time, only my strength returns very slowly. Yet I am able to undertake moderate excursions; longer ones I must defer, till the occasional rains cease entirely. I am most desirous of going to the mountains and to lead there for some time a really natural existence; for here there is a wretched mixture of artificial and natural. For these last five weeks, we have had every thing in our domestic arrangements to superintend ourselves; otherwise we must have engaged more servants, and that is not only expensive, but we have quite enough to do to manage the two we have. An African servant will not listen to orders, but will do every thing out of his own head, and if his taste does not agree with his master's, the master he thinks must comply with his. If I say to the cook, "this must not be dressed so," he answers quietly, "That is how I like it;" and if my servant, contrary to my directions, goes out for the whole evening, he says coolly, "When you have got your meal, you have nothing more to do with me." It is often difficult to procure any thing for dinner; we have had no meat for two days, and there was none to be got for money. The same is often the case with bread, and if one has not a stock of ship biscuit, there is great difficulty about

it. The light afforded by a palm oil lamp is worse than that of the lamps which, in Germany, are allowed to servants, and this is very bad when we have any work to do in the evening. What I chiefly dislike is the host of ants, beetles, moths, &c., which swarm every where: they are very destructive to my collections, and I wage constant war with them. Besides the wasps, flies of all sorts, lizards, salamanders and rats pay us constant visits, so that a Zoologist ought to rejoice in having so good an opportunity to make their acquaintance."

While Vogel was busied in this manner with plans and preparations for future exertions, which bade fair to be productive, and this perhaps too early for his strength, the seeds of the last fatal malady were developed. In December, that is, at the time when the rain ceases to pour down in torrents, cold and damp weather prevailed in the island, which is highly prejudicial to Europeans.

In consequence, on the 4th of December, Vogel was seized with a dysentery which confined him to bed, and daily exhausted his strength. Dr. Thomson, surgeon of the Soudan, Dr. Mc William, of the Albert, and other physicians, paid him the greatest attention, and Herr Roscher, the companion of his journey, his fellow-lodger and friend, never left the bed-side of the patient, who bore all the sufferings consequent on his complaint with the strength of mind peculiar to him, and without ever losing heart. In spite of all, on the thirteenth day of his illness he departed, and without pain, about mid-day, on the 17th of December. His death was calm and peaceful. He had spoken daily of the expected wanderings amongst the mountains, and even a few minutes before his death he asked his friend if he had got every thing ready for their excursion. His mortal remains were committed to the earth the same evening, by the side of Captain Bird Allen, who departed before him. The ship's company carried the coffin, which was attended by the commander, Captain Fishbourne, Dr. Mc William, Captain Beecroft, Dr. King, Mr. Scott and his wife, and many of his fellow voyagers, by all of whom he was esteemed on account

of his benevolent and noble disposition, and his really Christian virtues. His little property, according to contract, came into the possession of the African Civilization Society, and it is to be hoped that his collections and journals, the precious relics of an activity, which was extinguished at the moment when a wider and more worthy field of action presented itself, will not be lost to science.

Vogel was by nature large and well-formed; his constitution, with the exception of a slight weakness in the chest and a tendency to rheumatism, was excellent; his countenance serious but benevolent, and exciting confidence. Active, without immoderate energy, he rested not till the work he had undertaken was accomplished. As a man, he was a fearer of God, of strict integrity, high-minded, indulgent towards faults; warm in speech, though with a constant observance of propriety. Towards his friends, he was always true and devoted, towards his colleagues, upright, disinterested and conciliatory. As a teacher, during the short time he was so employed, he excited approbation and love, and much was to be expected from him had he lived longer. What he would have done as a writer, is incontestibly shewn by his publications.

Journal of the Voyage to the NIGER *of* DR. J. R. T. VOGEL.*

Wednesday, 12*th of May*, after 7 o'clock, P. M., we quitted Devonport. Knowing that I should be attacked with seasickness, and not be able to attend with accuracy to many matters, I determined to confine my attention during the voyage to the subject of temperature, and more especially to that of the sea, which I therefore ascertained at noon, and noted in my meteorological journal. The weather being favourable, I suffered less, although never

* Translated from the original German Journal of Dr. Vogel, in the possession of the African Civilization Society, by the kindness of F. Scheer, Esq., of Kew Green.—ED.

quite free from sea-sickness, than I had expected, and became anxious to extend my observations to the temperature of the air, and to the barometer. Our instrument had not been rectified, and being without a thermometer to mark the temperature of the quicksilver, was rather useless: in our days, such imperfect observations are of little value. Nor could I find on the whole deck a place for my thermometer, without exposing it to many dangers, and the contrivance proposed by me for that purpose, and approved of by the captain, is not yet finished.

This evening I paid particular attention to the phosphorescence of the sea. In this latitude it is not seen except in the wake of the ship. Only the waves nearest the vessel were illuminated, and in fact, it appeared to me, that it was solely the case with those actually in contact with it. If so, the phosphorescence would seem, here at least, to be the result of mere mechanical friction. It did not appear to be much influenced by the moisture or dryness of the atmosphere, for being very strong on Saturday evening, when the psychrometer showed a difference of 1.1^0 (56.1^0 against 55^0). No animals or plants were picked up. At a distance I descried some dolphins, others saw *Algæ* and *Nautili*; and some tired swallows settled on the ship.

Friday, May 21.—We reached Madeira in the morning. The Flora of this island has become of late better known, through Mr. Lowe, who has described many new species. I intended to devote the few days of our stay to the study of the indigenous plants; but the uncertainty of our departure did not allow of distant excursions, and obliged me to limit myself to the vicinity of Funchal. I took immediately a walk along the south-eastern coast, with Mr. Lowe, who kindly pointed out the habitat of many indigenous species, amongst which were chiefly *Mathiola Maderensis*, *Sideroxylon Marmulana*, etc. On Saturday, 22nd, I was early on horseback, towards the Ribeira Frio, where, according to Mr. Lowe, the choicest native plants are to be found. The road

crossed Mount Church, whose barren precipices are at first covered with *Spartium scoparium*, higher up with shrubs of *Laurus* and *Erica*, and then especially with the magnificent *Vaccinium Maderense*. On the summit it was dreadfully cold, with fog, sometimes like rain. The valley was filled with mist, clearing occasionally, just enough to see the *Laurus* trees, that hung down from the surrounding steeps. This *Laurus*, several interesting *Ferns*, and a few other plants, were, owing to the bad weather, the unexpectedly small fruit of this trip. On the succeeding Sunday, I chiefly visited the gardens about the town. The singularly favourable situation of Funchal, enjoying in consequence of the protection afforded by the surrounding mountains against cold winds, an invariably moderate temperature, has been frequently dwelt upon. I had plenty of opportunity to perceive this, for during my stay, the weather was there constantly fine and warm, with, at the utmost, a gentle shower; but once beyond the mountains, I experienced the most furious winds, and the valleys were filled with thick mists, loaded with as much moisture as heavy rains. It were interesting to ascertain the duration and intensity of these mists, which are remarkably dense, and must be highly beneficial to a barren island and fertilizing to its valleys. Later in the season, the weather is said to be clear and settled in the interior also. The valley of Funchal receives several rivulets, and has not at this time any deficiency of water. *Chestnut trees* abound in the valleys, and the lower declivities are frequently covered with patches of *Pines*. To the gardens at Funchal the prevailing state of the atmosphere is highly genial, and they command splendid prospects towards the town and bay. One really may fancy oneself in the East when walking, and still more when riding between these gardens, which are enclosed with stone walls, over which it is easy to behold the numerous hedges of roses full of bloom. The singular spectacle of the union of *Bananas* and *Pine-apples* with our European fruit-trees, has been frequently noticed, and is particularly

attractive to any new comer. Horticulture, from what I could see, was chiefly practised for profit's sake; though in several gardens there were some choice plants, which struck, on account of their finer growth, the European traveller, who had hitherto only seen them in the greenhouse or stove. Large *Dracænas* were rare; whether this tree still occurs in an uncultivated state, I know not; no one collects the *Gum Dragon*, except as a curiosity. Dr. Renton showed me some fine *Coffee trees*, covered with fruit, of which the quality is said to be good. He regretted, that instead of *Festuca Donax*, the *Bamboo* was not more generally grown, as it succeeds so well; and I agree with him.

On Monday and Tuesday I made excursions in the valley called the Corral, and to the great water-fall, which yielded me, besides the common plants of Madeira, a few rare ones, viz.: *Ranunculas grandifolius*, *Sempervivum sp.*, *Sinapidendron frutescens*, Low., *Bystropogon punctatus*, Herit., *Bupleurum salicifolium*, Sol., *Physalis pubescens*, &c. According to my limited experience, the Flora of Madeira is of a thoroughly South-European character; only a very few plants, chiefly *Dracæna*, pointing out an extra-European mixture. I do not speak of the neighbourhood of Funchal; a botanical garden there, established with proper judgment, would lead to brilliant results; a novice in travelling revels in the southern forms here first offered to his view.

Of two individual plants I will only here observe, that the indigenous *Parietaria* is that known in Germany as P. *diffusa*. Of *Cassia* I only saw *Cassia bicapsularis*, L., the true species, flowering, but not in fruit, during my stay. *Cassia ruscifolia*, which is indigenous, according to Jacquin, in Madeira, Mr. Lowe assures me, certainly does not grow in the island, and that *Cassia occidentalis* exists only in a single garden. The history of these species remains therefore still obscure.

Tuesday, May 25.—Left Madeira in the evening. I had exposed myself too much during my last excursion to the waterfall, to the soaking rain, burning sun, and wet, in wading

through brooks. The guide had committed an error; for these people engage to conduct you any where, whether they know the place or not. I was, consequently, several days unable to move, and when we arrived, on Friday the 28th of May, in the port of Santa Cruz, I could do no more than cast a few glimpses on the island. The next day I resumed my observations on the temperature of the sea; but my illness, which was an entire interruption of the digestive powers, continued till we reached Cape de Verd Islands.

Thursday, June 3, we were off St. Vincent. We had mistaken the small adjoining Sta. Lucia for the former, and approached it so closely, that we could examine the nature of its shores, which gave only a prospect of wildness and sterility. Sailing along the high cliffs of the western coast of St. Vincent, I looked anxiously for some traces of vegetation, but only distinguished, far off, a few shrubs, and it was dark ere we anchored at Porto Grande. I hastened the next morning early on deck, impatient to survey, for the first time, an entirely tropical vegetation. The back of the bay is flat and sandy, with a few cottages on the north-east side; beyond the shore rise hills overtopped in the distance by mountains. I could clearly descry two main valleys, reaching far inland, and exhibiting the same white sand as the beach. Every place was burnt up and bare of vegetation, except a few shrubs in one of the valleys, whither I directed my first walk, and found these were *Tamarix Senegalensis*, a shrub mostly 6 to 7 feet high, but sometimes a small tree, being the only plant, I might almost say the only object, which in these valleys affords any shadow. After a search of four hours, climbing several hills and crossing as many valleys, I only met with two plants, the same *Tamarix*, and a low shrub-like *Labiata*, (*Lavandula formosa?*) almost dried up, with few leaves and some blossoms just opening. I found subsequently, that this plant spreads over the whole island. The Great Desert, whose horrors are so eloquently described by travellers, cannot exhibit a more desolate aspect than this part of St. Vincent. Yet the soil ought to be fertile, for

it is a conglomerate of large and small bits of basalt, in a loamy and chalky soil, closely covered in many places with dried grass, forming natural hay and furnishing scanty fodder to cattle and goats, when they have not the *Tamarix* to nibble at. This soil only wants water, and we may guess, from these remnants of its vegetation, how fertile it must be, when supplied during the brief rainy season with some moisture.* To the above-mentioned plants of the plain, (if I may so express myself, where there is only hill and dale), I could add subsequently very few more. A small *Euphorbia*, perhaps *prostrata* or *serpyllifolia*, but appearing new to me, a few littoral plants, especially *Zygophyllum album* or *simplex*; and on the shore, *Cassia obovata*, just then in blossom and fruit, and extending about 600 feet (German?) up the mountains. This scanty harvest induced me to explore the higher regions for more botanical treasures; but even there I found frequently the same barrenness. The mountain chain, which borders the western side of the chief valley, rising frequently to 1500 feet, only afforded me a dozen species on its northern declivity. Two spots however were more productive, viz: the highest ridge and the next highest, situated rather more towards the middle of the island. The former is undoubtedly the richest, and hence goes by the name of "Monte Verte." It is a basaltic rock, topping a gradually ascending table-land, according to my barometrical admeasurement, as high as 2500 feet. It is the only mountain in the island, having its summit always enveloped in clouds; consequently there are, on its upper half, many well watered spots, whilst every thing else is burnt by drought.

Of the difference between the lower and mountain vegetation I can hardly speak; but it seemed clear that many plants, flourishing on the mountain, did also grow in the lower country, though now dried up. With the *Tamarix* of the plain, grows a shrubby *Euphorbia* (I believe the only

* According to the natives, the wet season lasts from the beginning of August to the middle of October, pretty regularly, but sometimes very little rain falls.

frutescent *Euphorbia* of the island) commonly 2 or 3 feet high; but sometimes a small tree, with twenty or thirty leaves amongst the blossoms at the ends of its branches, it is characteristic of the mountains and gives an agreeable verdure to the clefts, abounding in the upper valleys and reaching to the very top of Monte Verte. It appears to be the same found by Brunner at St. Jago, and mentioned as *Euph. genistoides?* I think it is an undescribed species. A spreading, creeping, branching, completely leafless *Asclepiadea*, occurred frequently, at 500 feet, on small flats, or pendent from rocks, sometimes with white flowers at the tips of the branches. A handsome *Statice*, a *Campanula* (related to *dulcis*) a *Labiata* with red flowers and coriaceous leaves, (*Lavandula?*), a *Sida*, which I am inclined to think new, with a *Linaria*, *Borago Africana*, *Echium*, *Tribulus terrestris*, *Achyranthes aspera*, *Lotus* sp., half a dozen *Compositæ*, a shrubby *Urtica*, a flowerless *Sempervivum*, and a few *Gramineæ* and *Cyperaceæ*, formed in this region a pleasant spectacle, such as one would hardly have expected on an apparently desert island. The general aspect of vegetation was very European, enhanced by *Samolus Valerandi*, *Nasturtium officinale*, and *Plantago minor?* To these situations were some cultivated plants; but they looked, at least just now, very poorly; *Beans* (especially *Lablab*) *Maize*, *Cucumbers*, a few *Bananas*, *Cotton*, *Ricinus*, and *Batatas*, seemed to be the chief, but hardly in sufficient quantity for the six or seven hundred inhabitants. The *Bananas* furnished to us, were said to come from St. Antonio. There were also a few *Sycamore figs*, and *Jatropha Curcas*; there are said to be some *Guavas* and *Papayas*. A creeping *Convolvulus* is much grown, and in reply to my repeated inquiries, I was always assured that it was used as thatch.

In Cryptogamia this island is proportionally still poorer. Four ferns, all at above 400 feet, a few *Confervæ*, perhaps three or four *Mosses*, on the top of Monte Verte, all without fructification, and *Algæ* on the sea coast very sparingly. Of insects, I found chiefly flies and grasshoppers; few

beetles. On the whole I have collected here about eighty or ninety *Phanerogamia* in flower.

Wednesday, June 6.—Towards the evening we quitted this, certainly most sterile island, after a stay of thirteen days. I had been most anxious to visit the adjacent island, which from all accounts appeared more interesting; but this wish could not be indulged, the uncertainty of our departure rendering such an excursion hazardous. However, the Wilberforce had now to go there, (to Terrafal Bay) for water. We anchored off St. Antonio on the same evening, without exactly recognising the spot where we were. In the morning we descried the green shore, proving to be the valley which was to furnish the water. There is a plantation intersected by a clear brook, full in the upper part, but caught in ponds near the coast, for the purpose of irrigating the grounds; and as the distance is considerable, the ground very dry, and the conduits ill contrived, much valuable water is lost. It would be better to conduct the water in the exact direction of the chief valley, which would shorten its way to the coast considerably. The map of Vidal, however excellent, is not quite correct as regards this valley. Our short stay did not allow me to visit the whole valley. Close to the shore were many plants of *Asclepias gigantea,* whose shining coriaceous leaves attracted notice, even from on board ship. The plantation consists chiefly of some *Sugar-cane, Cotton, Papaya, Citrons, Limes, Guavas, Ricinus, Curcas,* and *Figs.* Higher up the valley *Bananas* are chiefly grown, with *Cassia occidentalis, Cocoa* and *Capsicum.* Amongst the plants on the sandy shore, there were frequently *Argemone Mexicana, Heliotropium,* a *Sonchus,* several *Grasses,* &c. The other indigenous plants correspond mostly with those of St. Vincent, but grow more luxuriantly. The same *Sida* was common; the usual *Euphorbia (prostrata?), Cassia obovata, Tribulus terrestris,* the leafless *Asclepiadea* of St. Vincent, *Borago Africana* and *Tamarix Senegalensis* were also found here; in the part of the plantation nearest the shore grows an *Indigofera* (near *Ind. Anil*) a new species of *Phaca,* (*Phaca*

micrantha), and a *Plumbago*, which if it be P. *scandens*, mentioned as belonging to St. Jago, must be indigenous on these islands. The brook in the main valley was full of *Bamboo*, which looked very pretty, especially where intertwined with *Convolvolus* near a small cascade. Along the stream there I also noticed an *Epilobium*, *Plantago*, *Cyperus* and *Samolus Valerandi*. *Orchil* is chiefly exported from this island.

Friday, June 18.—Left St. Antonio at noon. Unfavourable winds and the rolling of the sea made me sick for several days, and I found it not a little disagreeable to be every morning soaked with water, dripping into my cabin, when the deck was washed overhead. The first days, especially, it poured through in absolute streams, and swamped every thing. Of course, my plants suffered not a little, and many things were so spoiled, that I was absolutely forced to throw them overboard. If I were a surgeon in the Royal Navy, I would make most humble supplication that more care should be devoted to the construction of ship's decks, and recommend their being water-tight, which surely cannot be difficult, and if I were not attended to, I would add, like a second Cato Censorius, to every report a "*ceterum censeo*," that the decks be rendered water-tight. It must be surely extremely injurious to health to lie in wet beds.* On my recovery, (Tuesday 22) I recommenced my observations on the temperature of the sea, and was surprised to find it in this latitude still so high. It, however, soon decreased, and towards the coast became very irregular. With regard to the observation of Tuesday, June 22, at half past three, P.M., of 86^0 1′, I will here especially observe, that every care had been taken to avoid any chance of error.

Saturday, June 26.—We anchored towards evening at Free Town, Sierra Leone, which presents a very charming appearance. From the Cape of Sierra Leone to the town, gentle undulations, bordered by a mountain chain, on which

* This defect, it is well known, does not occur generally in men-of-war, and seldom except in man-of-war steamers.—(H. D. Trotter).

one may distinguish isolated trees, run close to the shore of the river, while the intermediate space, and even far up the ascent, is covered with the most luxuriant vegetation, brilliantly shining in the full tropical freshness of the rainy season, which is just set in. Between the shrubs, many negro villages, full of closely set cottages with pointed roofs, are sprinkled up to the town, and beyond it along the river. The town itself has a very pleasing appearance: though laid out in regular streets, the houses stand as yet singly amongst trees and shrubs. Probably the aspect of the country may not always be so agreeable; we are now at the end of the tornadoes when the land has been considerably invigorated by rains; a few months earlier it probably looked very different. Some turns of the mountain-road afford indeed most splendid prospects. The vegetation of Sierra Leone has been so often described, that my observations, limited as they were by our short stay, can hardly be worth notice. What may perhaps not be generally known, is the fact, that *Orchidaceæ* occur here frequently; at Mr. Whitfield's I saw a collection of more than thirty species, which he means to take to Europe in a living state. The edible fruits, so interesting through Sabine's publication of Brown's Remarks in Don's Collection, were not just now to be met with, and it requires, in fact, more local knowledge than can be acquired in a few days, to get them together. I inquired a great deal after the somewhat mystical *Cream-fruit* of Afzelius. The name was unknown; and several persons, even Mr. Whitfield, guessed from my description, that it must be a fruit they called *Bird-lime*, of which the said gentleman gave me a dried, nearly ripe specimen. It is not eaten readily by any body. Although there are here discrepancies, I must after all believe, that we have yet to learn whether *Cream-fruit*, *Bird-lime* and Don's sweet *Pishanin* are, or are not, identical. The *Oil Palm* (*Elais Guineensis*) is the only one occurring often near Free-Town. It is monoecious; the male flower growing above the female. It produces fruit (perhaps not always) when only 7 feet high, and before the

lowest ribs have decayed. I also saw a *Leguminosa,* belonging, as far as I could judge from the fruit, to the genus *Afzelia,* but if so, it would form a separate division. Though a rich flora, it was not, either near the town or in the mountains, by any means so luxuriant as descriptions had led me to expect. The soil is a close clay, impregnated with iron, and cannot therefore be fertile. It having been soon ascertained that the land near the town could not yield so much as had been expected, the attention of the earlier emigrants was already directed towards other parts of the vicinity. I know not with what success; but it is singular, that this thickly peopled colony should not produce any thing fit for exportation; the trade in teak or comwood seems only a waste of the rich endowments of nature. This surely is a matter worth consideration. The Africans, collected here in such multitudes, furnish abundant and cheap labourers, and yet there is no cultivation on an enlarged scale. Much diligence is used to convert and educate the "liberated Africans;" but without any beneficial influence n the neighbouring tribes. This is not very satisfactory, and shows that if it was intended to extend civilization to these parts, great faults must have been committed, and also proves that the Africans are not inclined to follow a good example. The liberated Africans, on their arrival at Sierra Leone, are apprenticed with a planter till their twentieth year; after that, a piece of land is apportioned to them, from which they raise a scanty maintenance. On the whole, their villages appeared to me, as far as I saw them, clean and cheerful (of course *cum grano salis*). But the total want of hospitality, for several times we found it impossible to get anything to eat, was painful.

During the few days that we spent here, the weather was mostly fine; the sky generally bright, with a hot sun, though sometimes clouded; towards evening tornadoes occurred, bringing frequently several hours' rain. After having abundantly enjoyed the noise of African tongues and the offensive exhalations of their persons, especially on Thursday,

when the Kroomen and negroes were engaged, we left Free Town on Friday, July 2, about noon. Having the "Soudan" in tow, we made but slow progress, and only got to Monrovia,* on Monday, July 5, and cast anchor in the bay. The few hours which I devoted to a walk towards the head of Cape Mesurado, taught me, that the vegetation is very similar to that of Sierra Leone. *Sarcocephalus esculentus* grew abundantly; and the fruit called pomegranate by Don, occurred sparingly. A *Poivrea*, with beautiful red flowers, seems new. *Cassia occidentalis*, *Borreria Kohautiana*, and an herbaceous *Phyllanthus* grew in abundance. Around the dwellings *Coffee Trees* had been planted, but left to grow too freely; *Limes*, *Figs*, *Curcas*, *Guavas*, *Ananas*, *Anona muricata* and also *Cytisus Cajan* and *Arrow-root* were cultivated; *Bananas* and *Oil Palms* occurred of course. The plantations were no doubt more extensive, but during my short stay, I could not see more, I was told, of *Cotton* and *Sugar*. *Anona muricata* is much eaten, both here and at Sierra Leone, under the name of *Soursop*, and I was assured that it is considered the finest of all, but I could not taste it without disgust; altogether I cannot join in the praise of African fruit. The land was not very rich. On the shore there is the same iron clay as at Sierra Leone, and somewhat higher up to the Cape it also prevails (according to Rosher), only finer grained and firm. In several places water (rain?) has percolated, and caused it to assume singular shapes, almost models of mountain ridges.

Monrovia Town has a pleasing appearance, many of the houses are large. Few white people are seen. The coloured population, few of whom I had any intercourse with, appeared inquisitive, obtrusive, and fond of idleness; no traces of hospitality, but an eagerness to make money, and a desire to affect importance. The connection† between Liberia and

* Monrovia is the capital of the American colony of Liberia.—(H. D. Trotter).

† The settlement of Liberia is under the control of a Society, in the United States; the Superintendent being appointed by the Society and

the United States, I could not make out very clearly. There is but one flag flying in Monrovia, that of the United States, viz: on the house of the Governor, professedly because he is the American Consul. The school-house is a large hall, hung with maps of Africa and America; there were also near the raised desk some philosophical instruments, used by the missionary, who had also some prepared heads of animals, as he told me, during his lectures. The boys and girls are taught in the same room; but as I was there only during the free hours, I could not witness the method of instruction practised. It is singular, that instead, as we hear of Liberia being on good terms with the natives, it is always at war with them. The last war ended about six months ago. The inhabitants allege the destruction of the slave factories as the cause.

The rainy season had now fairly set in, and my cabin being so damp that I could not dry either plants or paper, to form a collection became impossible, and I carried away but a few single specimens.

Near Monrovia, is a Kroo town, whence fishermen, in their small canoes and with angling lines, came paddling about our ship. Except a slight covering on the head, they were quite naked; and in warm weather, this was probably the fittest attire for them.

Towards the evening of Tuesday, July 6th, we left Monrovia, and until Thursday evening, were in tow of the Albert. We then proceeded, by ourselves to Grand Bassa, where we anchored on Friday morning, for the purpose of taking in fuel. We stayed several days, not one of which passed without rain, sometimes most violent throughout the entire day. This and other circumstances, limited my researches to the immediate vicinity of the shore, where, however, I found more plants than I was able to preserve. I made a collection

not by the United States government. By the laws of the United States, the Federal Union cannot possess colonies, beyond the seas.—(H. D. Trotter.)

of about a hundred specimens, at the risk of losing every thing by the wet. Many plants, especially the *monocotyledonous*, were not yet in flower; and I regretted this most especially in the case of the numerous parasitical *Orchideæ*. The shore is flat and sandy, and the sand has drifted so far inland, that I never got beyond it. There were no forests, only bushes, intermingled with isolated high trees, which I could not determine, for they were all without blossom or fruit. The African *Bombax* appeared amongst them, and I found the same *Spondias* as at Sierra Leone, forming a considerable tree, respecting which I feel doubtful whether it be identical with *S. Myrobalanus*. The pride of this coast is the *Elais*, often growing in clumps of twelve or more, exhibiting under different circumstances a different habit, and giving a considerable variety of aspect to the country. This *Palm* is of generally moderate height, and constitutes with various *Fici*, the chief masses of wood. The underwood consists of close-growing shrubby *Rubiaceæ*, with shining leaves, intermingled with *Gloriosa superba*, *Cissi*, *Leguminosæ*, *Banisteriæ*, as creepers, leaving hardly room for *Melastoma* and other low plants that peep through with their fine blossoms. It is a very interesting sight, that of a few *Oil Palms* growing in a clump, the ribs of the lower leaves still adhering to the stems, which are clothed with a fresh verdure of parasitical *Ferns* and *Orchidaceæ*, whilst other parasites, such as *Ferns*, *Pothos*, *Anonæ*, *Commelinæ*, small *Rubiaceæ* and *Leguminosæ*, choose the airy shelter of the foliage for their habitation. Of single plants one might specify *Sarcocephalus*, which occurs frequently, the same *Phyllanthus* as in Liberia, *Schmidelia Africana*, a genus of *Apocyneæ*, apparently new and near *Tabernæmontana*, remarkable for its double fruit as large as a child's head, the seeds nestling in the almost woody pulp, wild *Sugar-cane*, not in blossom, *Conocarpus erectus*, var. β. a small shrub, a probably new *Cassytha*, *Scævola* (really different from *S. Lobelia*?), *Indigoferæ*, sp. *Canna*, sp. *Cassia occidentalis* (cult[d].), *Boreria Kohautiana*, &c. The *Stylosanthes* forms a close jungle, with its erect and much

branched stem, about 1½ foot high, along the sandy shore. A few open spaces amongst the shrubby woods were covered, as if cultivated, with *Cyperaceæ*, amongst which a species of *Eriocaulon* is frequent. A few more watered spots showed *Grasses*, with a beautiful *Orchidea* 2 or 3 feet high. Near the village, I found *Euphorbia drupifera*, Schum. An excursion to the river enabled me to examine the *Mangrove woods*, where a *Rhizophora* (different from *R. Mangle*?), but not yet in ripe fruit, formed the bulk of the woods; amongst it an *Avicennia*, judging by the leaves, different from that at Sierra Leone (*nitida*?), was frequent, and the shrubby *Conocarpus racemosus* (is it not identical with an American species?), which so far as I know, has not yet been enumerated amongst African plants, but inhabits similar situations at Sierra Leone. Intermixed with these, *Drepanocarpus hamatus* rendered my progress very difficult. *Pandanus Candelabrum*, without leaves, occurs here for the first time, in swamps. An *Anona* (a tree 10 to 12 feet high), in fruit, and apparently very similar to *chrysocarpa*, Lepr., if not the same, was not uncommon in these swamps. Leguminous trees seem rare, and do not attain a large size; there are no *Mimosæ* or *Cæsalpiniæ*. Of cultivated plants, the *Sweet cassada* is most valued and grown; also *Rice*, various sorts of *Capsicum*, *Papaw* and *Plantains*, and *Holcus* here and there, with *Ananas* in large quantities amongst the shrubs.

Our anchorage was between a town belonging to Liberia, and called Idine (according to the pronunciation), and the River Keún, nearer the latter. The jungle begins with the flat shore, and the native villages, consisting of a few huts, are situated amongst it. The Kroomen live near the shore; the natives are of another race. The cottages of the former which I visited, were neat and clean, built of mats, square, with pointed roofs, and generally a raised floor, 1½ feet above the ground, composed of plaited palm-ribs. The Kroomen themselves appeared rather intelligent; and they pleased me by their straightforward and modest behaviour, touching

none of my things without permission, which might have served as a good example to the people of Liberia.

Wednesday, July 14th.—We left in the afternoon, and anchored on Friday, July 16th, about ten o'clock, A.M., off Cape Palmas, to take in a fresh supply of fuel. The Cape is formed by a narrow projection into the sea, on the foremost part of which, the houses of the American colony have been built. The dwellings of the fishermen are situated on the part nearest the main land. Their huts are very different from those of the Kroomen of Grand Bassa, being without raised floors, and having much more pointed roofs. The buildings of the American colony are straggling, and they extend, as I was told, about four miles into the interior. There are none but people of colour at the Cape; the only whites, if I understood rightly, being a few missionaries, who devote all their attention to the natives. At this colony, the soil is very bad; the rock, frequently protruding through it, consists of hornblende (micaceous slate). The soil is a very hard iron-clay, in small clumps, originating, according to Rosher's statement, in the *débris* of decomposed granite veins traversing the rock; but to me it appears that the rock itself has much to do with the formation. Further up the stream, the land is said to be good. North of Cape Palmas, the river, according to the statement of the Governor, is navigable for seven miles with canoes, and empties itseelf into the sea, through several mouths. From a distance, the Cape has an agreeable aspect; the isthmus is well clothed with vegetation, and beyond it the beautiful forms of the *Oil* and *Fan Palm* are seen.

My excursions were limited to the isthmus and nearest parts. On the isthmus grows *Phœnix spinosa*, Th., a low shrub; beyond the river it is said to produce flowers and fruit. A few *Cocoas** had been planted, some years back, and

* The inhabitants believe, that whoever plants a Cocoa-palm, will die before it produces fruit (i. e. in about seven years). The chief of the fishermen yielded at last to the entreaties of the American Governor, and

were still small, as were the trees of *Anona muricato*. The plants chiefly cultivated seemed to be *Cassava*, *Sweet-potato*, *Bananas*, *Plantains*, *Indian corn*, and *Rice*, while *Cassia occidentalis* was seen in every cultivated spot; the same *Spondias* as before grows also here; *Coffee* had been introduced from Monrovia; here and there the indigenous species of *Cotton* had been raised; *Arachis hypogæa* (*Africana* ?) I found planted in one place. Of the native Flora, which, however, I have hardly seen, *Rubiaceæ*, *Convolvulaceæ*, *Leguminosæ* were chiefly conspicuous. The same *Anona* (near *chrysocarpa*) as in Grand Bassa grew here; *Pandanus Candelabrum* on dry ground, several sorts of *Figs*, amongst which is the small fruited kind of Grand Bassa; *Jatropha Curcas* was frequently employed for fences. Amongst the underwood I found a small shrubby tree, related to *Belvisia* (*Napoleona*), and probably a distinct genus nearly approaching it, it bore blossom and fruit; the latter convinced me that I had seen the same, and a species but little differing from it at Grand Bassa.

Sunday, July 18*th*.—We left Cape Palmas about 2, P.M., and were off Cape Coast Castle on the evening of Saturday, the 24th. On Sunday, Captain Trotter issued a circular, prohibiting any one belonging to the expedition from remaining all night on shore, the unhealthy season here having begun. The Gold Coast was of the greatest importance to me, the plants described by Schumacher forming a sort of standard for the African Flora; but I deemed it best to be careful, and to decline all friendly invitations to stay on land, although this would have been of infinite advantage in collecting, and in fact almost indispensable.

The vicinity of the town exhibits no great fertility; granite and gneiss, often naked, extending to the coast. A few miles inland, a fine black loam prevails, apparently very favourable

put some Cocoa-nuts in the ground; he then drove cattle over the spot, that he might not incur the consequences of planting and covering them with earth!

for cultivation, and further inland still, the soil is said to be extremely fertile, consisting probably of vegetable mould. On account of the heavy surf, it is impossible to land, otherwise than in canoes; and in this and every case where you are obliged to depend on negroes, punctuality is out of the question, and much time was always lost. A trip to the Model Farm, five miles inland, now under the superintendence of Mr. Wilson, promised to make this place very interesting. The major part of this plantation lies on the declivity of a hill, consisting of indifferent soil, (decomposed granite), whilst before and beyond it, the land is excellent. They call this plantation "Napoleon." The dwelling-house is on the top of the hill, and commands a very interesting prospect. The plantations consist chiefly of *Coffee-trees*, only a few years old; some, covered with fruit, were, according to Mr. Wilson, of only seven months growth, which seems truly wonderful, for in the West Indies, *Coffee* bears no fruit even in the best soils under eighteen months. Besides *Coffee, Bananas, Plantains, Arrowroot, Yams, Limes, Lemons, Oranges* and *Indian corn*, were much cultivated. In the grounds of the natives, *Indian corn, Bananas, Plantains* and *Yams*, were conspicuous, but no *Holcus* (!) From the *Indian corn* they prepare a very sour bread, which with *Bananas*, constitutes their chief food. Palm-soup, a native dish, when made of boiled *Palm-nuts* only, is very well flavoured. They pick the nuts off those young stems of the *Elais Guineensis* which have not yet lost any of the leaves, and consider these as superior to the fruit of older plants, and cut them also down, to collect palm-wine. Besides this *Palm*, there is the *Cocoa*, which frequently assumes a singular aspect from the multitude of birds' nests which are appended to the mid-rib of the leaves, and which might be taken at a distance for fruit, and had formerly puzzled me in drawings. The birds hang their nests in this position to protect them against the cats! The *Fan-palm* grows too at Cape Coast Castle, but apparently is less frequent. To judge by parts of the stems which I met with, *Calamus* must occur further in the interior.

Another excursion was about six or seven miles inland, to Orange Town and Quowprath. Here the soil was fertile, with good vegetable mould and extensive plantations of *Indian corn; Bromelias* skirting the former plantations. The best habitations of the natives resemble those of the Ashantees, and have a square court in the middle, its four sides surrounded by buildings.

It is almost impossible to travel in European clothes, especially during this season, when the water collected in the roads reaches often up to the middle. Besides, great exertion or exposure to the sun is dangerous, and occasionally fatal to new comers. The residents go out in small carriages, drawn by four negroes; or travelling-chairs carried by two. The former can only be used on tolerably good roads, and the latter have also their inconveniences. For instance, I was myself upset in the middle of a puddle, because my bearers slipped, but I happily fell on an adjacent dry grass-plot. It is a great inconvenience for persons who, like me, travel *ex professo*, that at such places as Cape Coast Castle, it is impossible to hire the necessary vehicles, but you must be dependent on the kindness of others. I had the good fortune to find, in Mr. Henry Smith, a man who anticipated all my wants with the utmost affability, assisting me, in fact, in every possible manner.

There is much less of botanical interest near the town than I had expected, the number of plants increasing materially with the distance from it. The present season, immediately subsequent to the rains, is not very favourable; the rain had nearly ceased on the coast, and only a few showers fell now and then; but a few miles inland, much rain prevails about this time, and on my trip to Quowprath, about six miles, I got thoroughly soaked. I saw many plants without flowers or fruit; but not one that was *Monocotyledonous*, though many are said to occur with splendid flowers. The difference of the vegetation from what we had last visited, was very striking. Here *Leguminosæ* were predominant, and *Rubiaceæ* less so; *Mimosæ*, with their characteristic foliage, which I had

hitherto seen but rarely, became conspicuous. The country is varied with hill and dale, and covered with shrubs 6 or 7 feet high, intermingled with single lofty trees, particularly *Bombax*, in leaf, but without blossom or fruit, which the inhabitants call *Iron-wood.*

I found another single tree of considerable height, with flowers and fruit; it seems to be a new genus related to *Crescentia.* The fruit is filled with solid firm pulp, 2 feet long, 1½ foot broad hanging downwards, as also does the flower, by a long pedicel. About the town, and in its vicinity, grows a half-shrubby *Cassia,* similar to *occidentalis,* but with a round divided fruit which might be taken for that of *C. Sophora.* The true *Cassia occidentalis* occurs likewise. *Poinciana pulcherrima,* just coming in flower, prettily lined the roadsides; and in the jungle grows a yellow *Composita* (I only saw two *Compositæ* in flower) which often adorned great parts of the way, and seems diffused over the whole coast. *Sarcocephalus* was seen in blossom and fruit. The new genus of *Apocyneæ,* with large fruit, did not occur. A beautiful avenue of *Hibiscus Populneus*(?) planted at the west end of the town, forms one of the marked features of Cape Coast Castle. As we were about to proceed to Accra, I thought it important to avail myself of the opportunity and visit, if possible, the Danish settlements, founded in the interior by Isert, and to obtain information respecting them, which had not been received at all of late. The Wilberforce was not ready for sea, but the Albert left on Friday, the 30th July, and Captain Trotter allowed me to make the passage in this vessel, thus saving much of my time. We anchored on Saturday afternoon, at British Accra, but it was late before I got on shore, for the surf would not let us land without canoes, which, as at Cape Coast Castle, are made pointed at one end, and provided with a high bulwark.

As my excursions led into the mountains, Dr. Stanger offered to accompany us, and Mr. McLean, who went with us on shore, kindly provided us with quarters for the night, it being too late to proceed to Danish Accra. Sunday

morning, the 1st of August, we set out in two little carriages, each drawn by four negroes, (here also the common way of travelling for Europeans) for Danish Accra, where we called on Mr. Richter, a Danish merchant, and accompanied by him visited the Danish Governor, Mr. Dall, to whom Mr. Richter and Mr. M'Lean introduced us.

The fortifications here are not important, they consist of a few large houses, with lofty, airy rooms surrounded by a wall and breastwork, and are inhabited by the Europeans. They are white-washed and conspicuous at a great distance. The Danish fort is classic ground for a botanist, for here Isert and Thonning made the collection, through which we became acquainted with this Flora. The humane spirit of Isert, so warmly expressed in his writings on behalf of the negroes rendered this place highly interesting to me, and the more so, as we were engaged in an enterprize, aiming at the objects, which he had endeavoured to attain during the latter years of his life. I inquired anxiously after his establishments in the interior, but could obtain no official information about them. After Isert's decease, they had gone to decay. Mr. de Khon, who is said to have assumed the management, and introduced the plough, and is represented in various works which I have read, to have effected so much, never came here, as Mr. Richter and the Danish Governor positively assured me! Since his time, indeed, no one took any trouble about these plantations; and about 1808, they were altogether given up. Every thing is now a wilderness, and the place not to be recognised. Flindt established about this time, another plantation on the River Volta near the Fort, the main object being distillation; but this was soon discontinued. About ten years ago, I believe another plantation was formed at the foot of the mountain in Aquafim, named "Frederic's Gau;" and as we wished to visit it, Mr. Dall had the kindness to indulge us; but he told us, that it was not extensive, and the superintendent being ill, it could not be in a very satisfactory state. The distance is fourteen or fifteen miles, the only mode of getting

there is by a sort of palanquin or basket, carried by two poles, on the head of two or four negroes. Mr. Dall, by providing abundantly for all our wants, caused our *cortège* to amount to about sixteen persons. The direction, according to compass, was almost exactly N. by E. We started at half past eleven o'clock. The first and greatest part of the way leads through Savannahs, covered with *Grasses* and *Cyperaceæ*, intermixed with many species of shrubby and half-shrubby *Leguminosæ* besides a few species of *Malvaceæ*, and some tall, but more generally only moderately high trees, viz: *Bombax*, the genus which I mentioned at Cape Coast as perhaps related to *Crescentia*,* *Ficus*, *Fan palms*, *Euphorbia drupifera*, very conspicuous from its naked spur-like branches, bearing only a few stiff inversely spathulate leaves at the extreme points, and near the villages and huts *Tamarinds* and *Hibiscus populneus*. Towards the coast, the soil is sandy like decomposed sandstone; but soon improves from the culture of *Indian Corn*, *Cassava*, *Yams*, *Arachis*, various sorts of *Cucumbers*, and *Bananas*. *Cocoas* are little cultivated here, or in any part of Africa, which I have seen. We crossed several ridges of hills affording pleasant views over the surrounding country, covered with fresh green, and struck then into the jungle, where the shrubs, common on this coast, grew abundantly, about a man's height, and closely interwoven with creepers. *Leguminosæ* diminished and *Rubiaceæ* increased. *Sarcocephalus*, described by Schumacher as *Cephalina esculenta*, Th., is not uncommon. We arrived at the settlement towards six o'clock, P.M., too late to see much. The house of the superintendent lies half way up the mountain ridge, and is roomy and comfortable, and being white-washed is conspicuous far off. At the foot of the mountain is a negro village and the plantation. Monday, August 2nd, having passed the night, in consequence of the friendly care of Mr. Dall, most comfortably, and supplied with every convenience, we were off at dawn of day; thermom. $73\frac{1}{2}°$ Fahr. The mountain is a quartz rock, covered

* May it not be the *Bignonia tulipifera*, Schumacher.

in many places, and often to the depth of several feet, with vegetable mould, overgrown, where not cultivated, with Brushwood. The site of the house was at an elevation of about 1000 feet and 100 above it grew a high *Oil Palm.* The Brushwood consisted chiefly of *Rubiaceæ*, interwoven with *Convolvulus;* few in flower and none remarkable. In the plantation were the usual edible plants of this country; the settlement consists of a coffee ground, of no great extent. Governor Dall told us that about three years back, the trees had been destroyed by an insect, and they were now very small 3 to 4 feet high, but thriving and bearing abundantly. The soil is excellent and rich, but the establishment looked neglected, which must be ascribed to the absence of the superintendent. Close by is another coffee ground belonging to Mr. Richter, but none of our companions speaking English, I only heard of it after our return. Near these grounds is an avenue of *Soursops* (*Anona muricata*) and *Oranges*, and close by several trees just now bearing ripe fruit, clearly the *Akee*, or *Blighia sapida.* They seem to have been planted; but on looking into Schumacher's description of Guinea plants, I found a *Cupania edulis*, mentioned as an indigenous tree, which I dare say, is identical with the above.

As we had only leave of absence until sunset of this day, we were obliged to content ourselves with the slight survey of a few hours, and after enduring an hour's heavy rain, we started at eleven o'clock and came back by the same road, though being down hill, we got on faster, and having returned sincere thanks to Governor Dall and Mr. Richter for their obliging and liberal assistance, we arrived in good time at British Accra, where we found that the hour of departure had not yet been fixed.

As soon as I got on board the Wilberforce, my first care was to shift my entire collection, especially the plants gathered since we arrived at Cape Coast Castle, but though I had taken all possible care, much was spoilt and almost everything in a bad state. It has been my lot with almost

all my collections on this coast, that after endless labour, I could only get together ill-conditioned plants; for dampness and want of room are obstacles impossible to be overcome, and which forced me at last to satisfy myself with the miserable consolation, that I have done all the circumstances would admit. I mention this, on purpose, that in case my collection comes into other hands, I may not be accused of negligence. I have sacrificed every convenience to gain room, and spared no trouble to overcome the dampness of the ship and of the atmosphere, but without success. The general arrangements of a man-of-war do not give much opportunity for such experiments. When will the time arrive, that expeditions, whose result must depend on the observations of naturalists, will afford them, from the outset, the appropriate and necessary support? At present, the vessels are fitted up for other purposes, and it is left to chance, to discover a little nook for the philosopher. I was now obliged to devote the two days remaining which we spent at Accra, to the drying of my collection, that all might not be lost.

(*To be continued.*)

Sur le genre Godoya *et ses analogues, avec des observations sur les limites des* Ochnacées, *et une revue des genres et espèces de ce groupe; par* J. E. Planchon, *docteur-ès-sciences.*

(*Continued from page* 600.)

Gen. III. Blastemanthus, Nov. gen.

Godoyæ sp. Mart. et Zuccar.

Calyx gemmiformis, 5-phyllus, bracteis 5 adpresse-imbricatis, sepalis conformibus cinctus, deciduus. Petala 5, angusta, æstivatione imbricato-convoluta. Staminodia circiter 20,

staminibus exteriora uniseriata, inter se libera et æquidistantia, subulata. Stamina 10, sub anthesi unilateraliter dejecta; antheris subsessilibus, lineari-fusiformibus, apice in rostrum poris 2 subposticis apertum attenuatis. Ovarium brevissime stipitatum, respectu floris paulo excentricum, fusiforme, apice rostratum, 3-5 loculare, loculis ad angulum internum pluriovulatis. Stigma sessile, obsoletum.

Arbor Amazonica. Folia alterna, oblonga, basi cuneata, in petiolum attenuata, apice rotundata v. sæpius retusa, margine integerrimo revoluta, glaberrima, nitida, fragilia, nervo medio angusto utrinque acute prominulo, secundariis veniformibus, tenuissimis, angulo fere recto patentibus inter se parallelis, rectis, creberrimis; areola insertionis petioli verticaliter oblonga, epidermide in marginem erosum quasi erupta, circumvallata. Stipulæ supra folii insertionem ramo insertæ! dentiformes, cartilagineæ, deciduæ. Racemi pauci supra axillares v. terminales, e gemma squamosa, decidua orti, hinc inde fasciculis florum bractea brevi-stipatis ornati; pedicellis alabastro gemmiformi, oblongo-acuto parum brevioribus. Flores aperti eos *Gomphiæ* referentes; ovarium legumeno junius Swartziæarum plane simulans.

Sp. unica. Blasthemanthus *gemmiflorus*.

Godoya gemmiflora, Mart. et Zucc. nov. gen. et sp. 1, p. 118, tab. 74.

Crescit ad ripas inundatas laçus *Teffe*, prope Villam *Egga* dictam, provinciæ *Rio Negro*.—*Martius*; *Schomburgk*, n. 990.

Gen. IV. Cespedesia, Goud. in ann. des sc. nat. sér. 3, vol. 2, p. 369.

Godoyæ sp. Bonpl.—Ruiz. et Pav.

Calyx minutus, pentaphyllus, foliolis liberis v. ima basi connatis, æstivatione plus minus quincunciatim imbricatis, deciduis (an semper?). Petala 5, obovata, calice multo longiora, æstivatione convoluta, caduca. Stamina indefinita (40-60), obscure triseriata, in alabastro ovario æqualiter

circum-adpressa, sub anthesi unilateraliter dejecta; filamentis brevibus, apice incrassatis; antheris lineari-tetragonis, sub apice rimulis 2 subpostice apertis. Ovarium lineari-oblongum, utrinque attenuatum, 5 loculare; axi centrali nullo, loculis ad angulum internum multiovulatis. Ovula minutissima, pluriseriatim imbricata, ascendentia. Stigma sessile, disciforme, subintegrum. Capsula attenuata, septicide 5-valvis, valvis basi et apice concretis, medio disjunctis, cymbiformibus, marginibus introflexis a chordis seminiferis solutis. Semina linearia, tenuissima, scobiformia: testa pellucida in vaginam subfiliformem producta, medio granulum cylindricum brevem fovente; raphe granulo paulo longiore, funiformi, solubili; tegmine fragile, crasso. Embryo rectus, linearis, granulo conformis et æquilongus, in axi perispermi albuminosi reconditus; radicula hilo proxima; plumula inconspicua.

Arbores Novo-Granatenses et Peruvianæ, proceræ, spectabiles. Rami fastigiati ramulique succum gummi-resinosum? exsudantes. Squamæ versus apicem ramulorum foliis subinordinatim commixtæ, et inflorescentiæ basim fulcrantes, singulæ intus ad basim seriem filamentorum ciliiformium foventes, perularum v. stipularam vicem usurpantes. Folia simplicia obovato-oblonga, obtusa, basi in petiolum planum gradatim attenuata, remote crenato-serrata, coriacea, nitida, nervo medio valido, supra acute, subtus obtuse prominente; secundariis paucis patentibus, subarcuatis, ad sinum crenæ cujusque productis, supra acute prominulis, subtus applanatis v. immersis; venulis tenuibus flexuoso-subparallelis, utrinque impressis, respectu nervorum lateralium transversis. Paniculæ magnæ terminalis rami floridi ebracteati. Flores speciosi, flavi.

Charact. ovarii et fructus e descriptione locupletissima, *C. Bonplandii*; floris ex eadem et ex. alabastris *C. spathulatæ*.

Sp. 1. Cespedesia *Bonplandi*, Goud. l. c.

C. foliis obovato-oblongis; laciniis calycinis ad basim liberis.

Hab. In aridis auriferis Novæ Granatæ, ad *Coyaima* et circa

Chamba, secus declivitatem orientalem Andium (*Cordillera central de la Nueva Granada*)—*Goudot*; et in temperatis prope *Mariquita*, altit. 8000 met. *Humb. et Bonpl.*

2. C. *spathulata.*

Godoya *spathulata*, Ruiz et Pav. syst. p. 102; Flor. Peruv. icon. ined. vol. 5, tab. 359.

C. foliis obovato-spathulatis; laciniis calycinis infra medium in cupulam extus 5-sulcam concretis.

Hab. In nemoribus ad *Chincao* et *Cuchero*, Peruviæ inferioris, *Ruiz et Pav.*

Sect. II. Euthemideæ.

Stamina 5, filamentis sterilibus totidem interdum interjectis. Antheræ læves, subsessiles, rostratæ, poris 2 apicalibus in unum confluentibus apertæ. Ovarii loculi 5 ad angulum internum biovulati. Ovula suspensa. Bacca 5-pyrena, pyrenis monospermis. Semina inversa, albuminosa.

Frutices Malayani, pulcherrimi. Folia alterna in petiolum marginatum semiamplexicaule angustata, cartilagineo serrata, rigida, nitida, insigniter lineato-nervosa. Stipulæ laterales, scariosæ, ciliatæ, caducæ. Racemi subsimplices, terminales, demum rami evolutione oppositifolii.

Genus unicum: Euthemis, Jack. in Malay. misc. et in Roxb. fl. Ind. ed. Wall. vol. 2, p. 303; Endl. gen. n. 5961.

Sp. 1. Euthemis *leucocarpa*, W. Jack. l. c. et in Hook. bot. misc. II. p. 69.; Planch. in Hook. icon. pl. tab. 711.

Hab. In insula *Singapore*, et in Monte *Ophir* peninsulæ Malaccensis, *W. Jack.—Wallich.—Lobb.* in herb. Hook.

2. Euth. *minor*, W. Jack. l. c.

Hab. In insulis *Singapore et Penang—Wall.—W. Jack.*

Observ. La plante dont le docteur Wallich ne put admirer que le feuillage, et qu'il a si bien décrite sous le nom d'*Euthemis? elegantissima*, (in Roxb. fl. Ind. ed. Wall. vol. 2, p. 305) me paraît, à cause de la localité et de ses stipules intra-axillaires, ne pouvoir être différente du G. *Sumatrana*, W. Jack.

Sect. III. Gomphieæ.

Stamina 8-10, v. plura. Ovarium 5-10 loculare, loculis 1-ovulatis, circa stylum simplicem, centralem, basilarem, in baccas discretas tumentibus; ovulis tunc seminibusque e basi loculi ascendentibus: v. rarius loculis 2-4 columellæ evolutæ circum-adnatis, parum tumidis; stylo terminali, ovulis ascendentibus v. subhorizontaliter resupinatis. Semina exalbuminosa.

Gen. I. Elvasia, D.C. in ann. du mus. vol. 17, p. 422, tab. 20.—Ad. Juss. Mém. Rut. p. 60, (in annotat.)

Subgen. 1. Euelvasia.

Petala 4; stamina 8; ovarii loculi 4 gibboso-prominuli; ovula e basi anguli interni adscendentia.

Sp. 1. Elvasia *calophyllea*, DC. l. c.

Hab. In Brasilia, *DC.* (an recte?), in Guyana! *Schomburgk*, n. 941.

Subgen. 2. Hostmannia.

Hostmannia, Planch. in Hook. icon. pl. tab. 709, (ovarii sectionis icon non bona.)

Calyx 3-4-phyllus. Petala 4-6. Stamina 18-20. Ovarium compressum biloculare. Ovula subhorizontaliter resupinato-deflexa.

Sp. 2. Elvasia *Hostmannia.*

Hostmannia elvasioides, Planch. l. c.

Hab. Ad *Surinam.—Dr. Hostmann.*

Obs. Les ovules sont, dans la figure que j'ai donnée de cette plante, représentés beaucoup plus manifestement suspendus, qu'ils ne sont en réalité. Des analyses réitérées de l'ovaire m'ont montré cependant que les ovules ne sont pas ascendants, comme dans l'*Elvasia,* mais plutôt légèrement inclinés du haut vers le bas, avec le raphé tourné vers le sommet de la loge. Malgré ces différences entre l'*Elvasia Hostmannia* et l'espèce type, je trouve trop de ressemblance dans leurs organes de végétation, pour oser en faire les genres distincts, avant que les fruits de l'une et de l'autre soient connus.

Gen. II. Ochna, Schreb. (Char. pessimum), Endl. gen. n. 5959.

Ochnæ sp. L. *Ochna et Diporidium,* Bartl.

Obs. Je puis me dispenser de transcrire les caractères bien connus de ce genre. En énumérant ses espèces tant décrites que nouvelles, j'ai tâché de les arranger suivant leurs affinités : cependant les groupes qu'on peut y admettre me paraissent trop vaguement définis pour mériter des noms de sous-genre. Bien moins encore faudrait-il admettre le genre *Diporidium* pour les quelques espèces du Cap qui trouvent leurs analogues dans l'*Ochna parviflora* d'Arabie, et probablement l'O. *pumila* du Népal.

* *Squarrosæ.*

Flores racemoso-corymbosi; antheræ lineares rimulis introrsis dehiscentes; stylus apice subindivisus. Species Asiaticæ et Africæ occidentalis tropicæ.

Sp. 1. Ochna *lucida,* Lamk. dict. 4, p. 510.

Ochna obtusata et O. *lucida,* DC. O. *squarrosa,* Roxb. Cor. tab. 89, (exclus. syn.)

O. foliis oblongis, argute serrulatis; floribus magnis, corymbosis; petalis sæpius 7-8, obovato oblongis; filamentis sub anthesi antheris fere 4-plo brevioribus; calycis fructiferi laciniis erecto conniventibus.

Hab. In Ind. Or. provinciis australibus, *Wight;* et in provinciis *Prome, Silhet—Roxb.—Wall.*

Obs. Je crois, avec De Candolle, qu'il faut rendre à cette belle espèce le nom sous lequel Lamark l'a parfaitement décrite, au lieu du nom Linnéen de *squarrosa* que Roxburg lui a appliqué. Linné, en effet, indiquant plutôt qu'il ne décrit son O. *squarrosa,* (Sp. plant. p. 731) prend les matériaux de cette espèce, d'un côté, dans la figure 56ème du *Thesaurus Zeylanicus,* où De Candolle a pu reconnaître sans peine le *Gomphia augustifolia,* Vahl, de l'autre, dans les figures de Plukenet (Alm. tab. 263, f. 1-2), qui représentent un des *Ochna* du Cap de Bonne Espérance. A cette amalgame déjà

assez hétérogène, Roxburgh, scrupuleusement suivi par Willdenow, ajouta l'espèce décrite ci-dessus, appliquant le nom et les synonymes Linnéens à une plante que très probablement l'illustre Suédois n'a jamais vue, parce qu'elle appartient à une flore qu'il connaissait à peine d'après les grossières figures de l'*Hortus Malabaricus*. L'O. *squarrosa*, Roxb. ne paraît pas croître à Ceylan d'où Linné avait reçu la plupart de ses plantes de l'Inde, et d'ailleurs, Smith, qui a écrit l'article *Ochna* dans l'Encyclopédie de Rees, n'aurait pas manqué de fixer tous les doutes sous l'espèce originale, s'il en existait dans l'herbier Linnéen un échantillon authentique.

2. O. *Wallichii*, nov. sp.

O. *nitida*, Wall. list. n. 2804, non Thunb.

O. foliis (in specimine florido non planè evolutis) oblongo-ellipticis, subtilissime serrulatis; corymbi pauciflori pedicellis elongatis; floribus speciosis; petalis 5 calice longioribus, obovatis, in unguem brevem angustatis; filamentis sub anthesi antheris sublongioribus; calice fructifero reflexo?

Flores expansi diametro plus quam pollicari. Antheræ circiter 2-½ lin. longæ.

Hab. In Ind. Or. prov. *Amherst—Wall.*

Cette belle espèce, qui est évidemment alliée à la précédente, s'en distingue sans peine par ses fleurs moins nombreuses dans chaque corymbe, par le nombre et la forme de ses pétales, et surtout par la longueur des filets relativement aux anthères. Ces dernières sont d'un tiers plus courtes que celles de l'*Ochna lucida*. Je mets un point de doute sur le caractère des pièces calicinales sous le fruit, parce que les échantillons en fleurs n'ayant pas leurs feuilles entièrement développées, il est difficile d'y rapporter les échantillons en fruit venus d'une source différente.

Sp. 3. O. *nitida*, Thunb. DC. in Annal. du Mus. vol. 17, p. 412, tab. 12, (icon. verisimil. non bona.)

Hab. In Ind. Or. verisimil. Ceylona, DC.

La figure que De Candolle a donné de cette espèce en reproduit assez bien l'aspect et les feuilles, mais représente sous

des proportions diminutives l'inflorescence, la longueur des pédicelles et la grandeur des fleurs. Les échantillons nombreux d'une plante de Ceylan que l'herbier de Sir W. Hooker doit au zèle obligeant de Mme. Walker me permettraient de modifier sur ces points la description originale de l'espèce, si j'osais le faire avant d'en avoir vu l'échantillon type. Je vais seulement décrire la plante que j'ai en vue, afin qu'il soit possible de décider plus tard, si elle est distincte ou non de l'O. *lucida*.

Habitus O. *nitidæ*, DC., (icon. cit.); ramuli patentes, non crassi; folia oblonga, utrinque acuta, argute serrulata, nitida, textura tenui sed rigidula; inflorescentiæ ramulos inferiores breves denudatos terminantes: nunc racemi breves, subsimplices (ut in icone Candolleana); sæpius thyrsi contracti, ramis confertim repetito-divisis. Pedicellorum articuli inferiores abbreviati, superiores graciles, floribus parvis subtriplo longiores; petala 5 angusta, calice sublongiora; filamenta antheris breviora; calicis fructiferi laciniæ erecto conniventes: baccæ oblongæ, subcurvatæ, parvæ, nigræ, nitidæ.

4. O. *multiflora*, DC. in ann. du mus. 17, p. 412, tab. 13.

Hab. In montibus *Sierra Leona*, Africæ occidentalis.

Obs. La description de cette plante laisse trop de vague sur ses caractères floraux, pour qu'il soit permis de juger de ses affinités spécifiques. Les anthères y sont indiquées comme ovales, probablement parce que l'échantillon n'en offrait que des fragments. On n'en voit pas de trace dans la figure.

** *Brevipedes.*

Flores fasciculati, breve pedicellati, gemmæ squamis diù involucrati: antheræ stylusque seriei præcedentis. Sp. Indicæ et Madagascarienses.

Sp. 5. O. *ciliata*, DC. in ann. du mus. vol. 17, p. 413, tab. 14.

Hab. In insula *Madagascar—Commers.—du Petit Thouars*, ex DC. *Bojer*, in herb. Hook.

6. O. *brevipes*, nov. sp.

O. ramis floridis denudatis ; fasciculis 3-5 floris, subumbelliformibus, ad apices ramulorum congestis, singulis e gemma squamosa ortis ; pedicellis flore subbrevioribus; petalis 5 late obovatis, in unguem abrupte angustatis, calice vix longioribus ; filamentis, sub anthesi-antheris paululum brevioribus.

Pedicelli subumbellati, vix 8 lin. longi ; flores quam ei O. *lucidæ* minores, expansi diametro 8-lin. Antheræ 2 lin. longæ.

Hab. In Ind. Or. *herb. Hook.* absque loco proprio.

Très distincte de toutes les *Ochna* de l'Inde par son inflorescence, cette espèce est au contraire assez voisine de l'O. *ciliata* de Madagascar, dont j'ai pu heureusement voir des échantillons, afin de m'assurer qu'elle est différente.

*** *Pauciflorœ*.

Pedicelli subsolitarii v. ternati, elongati, florentes basi nudati ; antheræ rimulis brevibus versus apicem apertæ : stylus subindivisus. Sp. Indiæ intra et extra tropicæ, Arabiæ tropicalis et Africæ extra tropicæ.

7. O. *pumila*, Hamilt. in herb. Lamb. ex DC. prod. 1, p. 736.

O. *nana*, Hamilt. in Wall. 1, p. 736, cat. n. 3761, ex Wight. et Arn. prod. fl. pen. Ind. or. 1, p. 152.

O. *humilis*, Wall. cat. ex Royle.

O. *collina*, Edgew. Descript. of sp. of pl. from N.W. India, in Linn. Trans. (ann. 1846) p. 43.

Quoique je n'aie vu aucun échantillon de cette plante, il me paraît certain qu'une seule espèce est désignée sous ces quatre noms. Les trois premiers, en effet, se sont substitués l'un à l'autre, simplement parce qu'ils impliquent la même idée ; et quant au dernier, M. Edgeworth ne le présente que comme dénomination provisoire, qui doit faire place à celui de *pumila* publié en premier lieu dans le prodrome de De Candolle. Les localités de ces supposées espèces sont très rapprochées, et tout ce qu'on peut saisir dans la courte phrase du Prodrome s'accorde avec les quelques mots que MM. Wight et Arnott ont dit incidemment de l'O. *nana*, aussi bien qu'avec l'excellente description qu'en a donné

M. Edgeworth sous le nom d'O. *collina*. Comme le volume des Transactions de la Société Linnéenne où cette description se trouve n'est pas encore en circulation, je me permets de la transcrire de l'exemplaire d'auteur que je dois à l'obligeance de M. Edgeworth.

"Suffrutex glaberrimus; ramis teretibus, basi stipulis persistentibus squamatis; foliis breviter petiolatis, ovato lanceolatis, tenuiter serratis; stipulis intra-petiolaribus apice plerumque bifidis (e duabus lateralibus connexis); pedunculis axillaribus folium æquantibus 3-floris; pedicellis basi bracteatis, infra medium articulatis; sepalis 5 late ovatis; petalis 5 rotundis, integerrimis, aureis; filamentis antheris subtetragonis brevioribus; stylo indiviso staminibus longiore; stigmate capitato."—Edgew. l. c.

Hab. In collibus glareosis sub-Sivalensibus, sub *Shoreis robustis*, prope *Sakranda, Saharunpoor—Edgew.*, etiam prope *Goruckpore—Royle*.

Sp. 8. O. *stipulacea*, Colebr. in Wall. ext. n. 2808.

L'échantillon qui existe sous ce nom dans la collection de Sir W. Hooker est malheureusement trop imparfait pour être décrit.

Hab. In Ind. Or.

9. O. *Heyneana*, Wight. et Arn. prod. fl. pen. Ind. Or. 1, p. 152.

Hab. In penins. Ind. Or.

10. O. *Wightiana*, Wall. cat. n. 2808; Wight et Arn. l. c.

Hab. In penins. Ind. Or.

11. O. *Walkerii*, nov. sp.

O. glaberrima; foliis parvis, elliptico-oblongis, brevissime petiolatis, utrinque obtusiusculis, tenuiter serrulatis, nitidis, supra læte viridibus, subtus pallidioribus, nervis secundariis tenuissimis venisque sub lente prominulis; stipulis brevibus, e basi lata subulatis, caducis; pedicellis infra folia e gemma propria ortis, unifloris, supra basim articulatis et unibracteatis, folio brevioribus; stylo apice breviter 5 diviso; calice, sub gynophoro accret onigrescente, pulchre rubente.

Frutex creberrime ramulosus: rami teretes, subtortuosi, grisei, ramulique abbreviati, inferne denudati; folia ad apicem ramulorum pauca (3-5), approximata, patentia, 12-15 lin. longa, 6-8 lin. lata, basi interdum subangustata, textura tenui sed rigidula; petioli vix 1 lin. longi, supra sulcati; stipulæ vix semi intra-axillaribus; bractea pedicelli e basi latiuscula subulata, marginibus involuta, vix 1-1½ lin. longa; filamenta, more generis, sub gynophoro accreto persistentia, filiformia, 2 lin. longa: calyx fructifer eum O. *atropurpureæ* referens.

HAB. In Ceylona—*D. Walker.*

OBS. Cette jolie plante, qui ressemble assez à l'*Ochna atropurpurea* du Cap de Bonne Espérance, et à l'*Ochna parvifolia* d'Arabie, se distinguera sans peine de la précédente par ses feuilles plutôt aigues à la base qu'arrondies et échancrées, et par ses stipules plus courtes.

12. O. *parvifolia,* Vahl symb. 1, p. 33—DC. in annal. du mus. vol. 17, p. 414, tab. 30, fig. 2.

HAB. In Arabia felici. *Forsk.*

13. O. *atropurpurea,* D.C. l. c. p. 398. *Diporidium serrulatum !* Hochst.

HAB. In parte orientali Coloniæ Capensis; ad *Riet founteyn* prope flumen *Kowi* in regione *Zuureveld, Burch.* ex schedulis privatis mecum benignissime communicatis; prope *Port Elizabeth* et in *Krakakamma,* district. *Uitenhage, Eckl. et Zeyh.*; ad *Zand Fountain, Burke,* in herb. Hook. ad *Hongklipp, Mundt* in herb. Hook. ad portum Natalem, *Krauss.*

Frutex 2-8-pedalis, *Burch. Zeyh.*

OBS.—Je ne vois dans les échantillons de Port Natal qui ont servi de type au *Diporidium serrulatum,* Hochst., aucun caractère qui puisse les distinguer, même comme variété, de l'O *atropurpurea.*

14. O. *arborea,* Burch., cat. geog. ex D.C. Prod. 1, p. 736. *Tetracera lutea,* Spreng. ex Cham. et Schlecht in Linn. 8. p. 177.

Hab. In sylvis primævis in *Olifantshoek* et *Adow* district *Uitenhage*, coloniæ Capensis, *Eck. et Zeyh.* et verisimiliter in sylvis district. or. non rara; ad. *Delagoa Bay*, *Forbes.*

15. O. *Natalitia*, Meisn in Hook. Lond. Journ. of Bot. 2. p. 58. (sub. Diporidio).

Hab. Ad sylvarum margines, prope portum Natalem, *Krauss*, coll. n. 454.

Obs.—Cette espèce est peut-être trop voisine de la précédente. A en juger par un échantillon très imparfait, ses feuilles (récemment développées) paraissent plus longues, d'une couleur plus pale, et bordées de dents plus profondes qui sont très sensiblement courbées en dedans. Ces différences se retrouvent-elles sur tous les rameaux de la plante, ou seulement chez quelques branches gourmandes? Par tous ses autres caractères, l'espèce coincide avec l'O. *arborea.*

16. O. *Delagoensis,* Eck. et Zeyh. Enum. Pl. Afr. aust. p. 118.

Hab. In Colonia Capensi, ad *Delagoa Bay*, *Eck. et Zeyh.* Frutex 1-pedalis.

**** *Fissistylæ.*

Flores racemosi; antheræ rimulis versus apicem dehiscentes; stylus profunde partitus. Species Mauritianæ, Madagascarienses et Africæ Australis subtropicalis.

17. O. *pulchra*, Hook. Icon. Pl. tab. 588, (sub. Diporidio).

Hab. Extra fines Coloniæ Capensis, ad *Macalisberg*, *Burke.*

Obs.—La figure citée représente parfaitement cette remarquable espèce, telle qu'elle existe dans l'herbier de Sir Wm. Hooker; c'est à dire, après que ses pétales sont tombés.

18. O. *Madagascariensis,* DC. in Ann. du Mus. 17, p. 413.

Hab. In Insula *Madagascar, du Petit Thouars,* ex DC.

19. O. *Mauritiana,* Lamk. Dict. 4, p. 512. DC. l. c. tab. 15 et 16 bis.

Hab. In Insula Mauritii.

***** *Spirantheræ.*

Flores racemosi; antheræ post anthesim subtortiles, loculis longitudine tota dehiscentibus; stylus subindivisus. Sp. Africæ occidentalis tropicæ.

20. O. *dubia*, Guill. et Perrot. Fl. Seneg. 1, p. 137, tab. 35.

HAB. In Senegambia, ad ripas flum. Casamanciæ, prope *Itou. Perrot. Heudel.* coll. n. 903; etiam in regno Oware v. regn. Benin, leg. Palis. Beauv. ex Guill. et Perrot.

OBS. Dans la description de cette espèce, il est dit que ses feuilles sont persistantes; je n'oserais assurer le contraire, n'ayant jamais vu la plante vivante. Cependant les échantillons de M. Heudelot ne présentent sur la même branche, d'où naît une grappe de fleurs, qu'une simple pousse dont les feuilles sont à demi développées.

(*To be continued.*)

BOTANICAL INFORMATION.

Extracted from a Letter from DR. LUDWIG LEICKHARDT* *of New Holland to* M. DURANDO, *of Paris.*

Communicated by P. B. WEBB, ESQ.

Cambden, May 20, 1846.

My dear friend,

You have, no doubt, noticed and regretted my long silence. There was no post to bring me your letters in the wilderness of Australia, through which I was endeavouring to penetrate

* See a letter written by the same enterprizing naturalist and traveller, previous to this most adventurous journey, given in our last vol. p. 278.

in a North West direction, nor to carry those epistles which I should have enjoyed to address to you. Thank God, my efforts have met with success, and I was preserved in the hours of danger. I arrived at Port Essington on the 17th December, 1845, staid there till the 17th January, 1846, and then returned to Sydney, accompanied by my party; all safe, except the unfortunate Mr. Gilbert. We came home in the "Heroine," Captain Mackenzie. You may easily suppose that I lost no opportunity of making botanical collections, and the length of time during which I was absent, between fourteen and fifteen months, enabled me to do so very completely and satisfactorily. The two Floras (that of the Eastern interior and of the Gulf of Carpentaria, including Anheim's Land), were presented to me in a successive state of flower, fruit and seed. As my specimens increased, I enveloped the different packages with raw hides, which, when dry, formed a complete kind of box around them, securing the contents, alike from weather and from the rough treatment to which they were occasionally exposed. But you must bear this in mind, my good friend, that it was not my lot to travel all at my ease, with every convenience at hand, and enabled to devote my whole attention to Natural History. On the contrary, I was compelled to do everything; I was alike leader of the party and bullock driver, and I had to load and unload three beasts of burthen, often several times in the day. All the cares of such a position were laid upon me; mine were the anxieties during the hour of difficulty and peril. To arrange our camp, deal out provision, kill the bullocks, and mend the harness, to compile the log and day-book of our route, to determine the latitude and longitude, and to keep nightly watch, all these various and ever-recurring occupations devolved upon me. Thus, even allowing that I did my very best, it is undeniable that a man, whose attention was less divided, could have effected infinitely more in any one department than I did. Gladly would I have made drawings of my plants, and noted fully all particulars of the different species which I saw; and how valuable would such memoranda have

been, when the time arrived which compelled me to cut open all my fine cases so carefully formed, made of hides, and to make a scanty selection from their contents, throwing the greater part away, through the utter impossibility of carrying them on, four of my pack-horses having been drowned. Botanical and geological specimens thus abandoned—how disappointing! From four to five thousand plants were thus sacrificed. I, however, preserved some highly interesting relics, which I shall transmit to you for determination, and you may keep the duplicates and triplicates, returning, of course, all uniques. I shall do the same with my Moreton Bay plants, for I earnestly desire to establish a well-named Herbarium in the Museum, at Sydney, in order to have the means of ready comparison, and I shall exert my best endeavours to send you everything, ere long.

You will, of course, know whether any botanist has it in view the completion of that noble *Torso*, thus to speak, of R. Brown's New Holland Flora; if not, it might be worth your while to collect materials, and set to work. I heard that Dr. Joseph Hooker, son of Sir Wm. Hooker, projects such a work;* and if so, I am sure you will assist him with all the means which I shall place in your hands.

My first thought on returning to Sydney, was to write and request you to come here; but I was not quite sure where a letter might find you, and I also feared the time was too short to enable you to arrive before I should be obliged to start. Another consideration was, that I did not then know how much money I could put at your disposal. After mature reflexion, I think the best plan will be for you to remain where you are, and to work upon an Herbarium for Sydney.

I hope my next expedition will be a famous one for botany. It is my intention to skirt the Gulf of Carpentaria again, at the head of its waters, perhaps two hundred and fifty or three hundred miles from the sea-coast, and thence proceeding

* The "*Flora Tasmanica*" is what must have been here alluded to. —Ed.

north-west, to travel down to Swan River, keeping parallel with the coast. Oh that my friend Durando could accompany me!

It is much pleasure to me to hear that my collection of woods gave satisfaction to M. Adolphe Brongniart, and I am now almost sorry that I asked anything for it; but at the time, I had not a single farthing in my possession, having expended my entire means on the expedition, and I started absolutely without funds, and therefore thought the thousand francs would serve as a *dernière ressource* in the event of my living to return. The colonists, however, have now given me most liberal help, and I am projecting various excursions. I should prefer to wait till the result of Sir Thomas Mitchell's journey of discovery is known; he is now prosecuting it, and as he travels admirably equipped and with every facility, I cannot doubt that he will add largely to our geographical knowledge of that part of the country lying north-west of my line of route. When I come home, I trust to be laden like a bee; for the north-west is the district in which to look for a remarkable Flora, where the Australian types are blended with those of India, and such is much the case with the vegetation of the Gulf of Carpentaria and Arnheim Land. The Indian forms of plants rose to view, one after the other, like the stars of the Northern Hemisphere, as I advanced into the basin of the Gulf; *Nelumbium, Nymphæa, Villarsia lutea, Cochlospermum, Zuccarinia* (?), *Stravadium, Cycas, Eugenia* (about five species), *Anacardium,* and the *Bamboo,* all these proclaimed the productions of Asia, and a close examination of the less conspicuous plants would probably give a still more decisive result.

As I shall not be in Sydney when your next letters arrive, I will request that they should be addressed to the care of my dear friend, Mr. Lynd, Military Barrack-master, who has been like father and brother to me, and is so still. He is, at present, Secretary of the Committee of the Botanic Garden and of the Museum, at Sydney.

I hear that Humboldt has at length published his *Cosmos*, but I have not seen the book.

You perceive that I use the English language for my letter; the long period of bush-life has rendered my French very rusty; but when I return from my next trip, I trust to regain my fluency in that noble language. My Journal of the journey to Port Essington is now in hand, and will be completed, I expect, in eight weeks more.

LUDWIG LEICKHARDT.

(M. Gaetano Durando, the gentleman to whom the foregoing letter is addressed, was an officer in the Sardinian army, who quitted the service to devote himself to scientific pursuits, and has opened a "Comptoir Botanique," for the sale and exchange of specimens, at Paris, Rue Cuvier, where he carries on a similar kind of business to that of Messrs. Hochstetter and Steudel, and M. Hohenacker, in Germany, and the late Mr. Hunnemann, in London).

Specimens of BRITISH RUBI.

The Rev. A. Bloxam, of Twycross, Atherstone, has rendered great service to the student of British plants by the publication of a few sets of the species of *Rubus* of this country, chiefly of the more difficult and less known kinds, amounting to about thirty species and varieties, at the cost of £1. each set. They are named with the assistance of Mr. C. C. Babington, and bear references to his "Synopsis of the British Rubi." Great pains have been taken in the collection and in the determination of the species, and the specimens are very full and satisfactory, and in the most beautiful state of preservation. So anxious is Mr. Bloxam to

be as correct as possible, that he has just communicated to us some alterations that have suggested themselves to him and Mr. C. C. Babington since the Fasciculus was published. We think it will be gratifying to him, and it will be useful to the subscribers, to notice them here.

1st. After R. *Borreri*, add a (?). Mr. Babington says of it, "not satisfactory."—Mr. Bloxam still considers it the true plant.

2nd. R. *amplificatus*, Lees. Erase underneath H. *macrophyllus*, γ. *amplificatus*, Bab. Syn. It is, however, the *amplificatus* of Lees as pointed out by himself to Mr. Bloxam; but according to Mr. Babington, it is not the plant sent by Lees to him as typical of the species.

3rd. R. *fusco-ater*. Alter to R. *Radula*, (C. C. B.) But Mr. Bloxam still considers it to be R. *Radula* of W. and N.

4th. R. *sylvaticus* (not the very round-leaved apiculate specimen, which Mr. Babington pronounces to be *sylvaticus*), but the other, which on the same authority is a doubtful plant.

5th. R. *dumetorum—nemorosus*, Hayne (the larger species;) alter to *fusco-ater* of Babington.

6th. H. *carpinifolius*; add a (?).

Tomb of the Botanist, Allan Cunningham.

(See the frontispiece).

The fourth volume of our "Journal of Botany," and the first of the "London Journal of Botany," contain a Portrait, and a Memoir of the life of the Botanist, Allan Cunningham, from the pen of Mr. Heward. It will be there seen, that it was the intention of the friends of Mr. Cunningham to erect a monument to his memory, in the small island in the lower Botanic Garden, at Sydney. This has been done; and Cap-

tain Phillip P. King, R.N. has sent to Mr. Heward a talented drawing of it and the surrounding scenery, sketched by himself, (which we are permitted to have lithographed for the frontispiece to the present volume of our Journal,) accompanied by the following note:—

"Sketch of the late Allan Cunningham's monument, with the simple inscription,

ALLAN CUNNINGHAM,

BOTANIST,

Died, June, 1840.

"It is composed of sandstone, and situated on an island of a pond, densely surrounded by weeping willows, in a very much frequented spot in the Botanic Garden, at Sydney. The clump over the garden-seat is of bamboo, and at the distance is a point of Port Jackson; the point on the left being a part of the Government demesne. There could not have been found a more appropriate spot for the memorial of our friend.

"PHILLIP P. KING."

March 19th, 1846.

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Eugenia comosa

London H. Baillière Regent St.   Maddey lith. 3 Wellington St. Strand

Pleuropetalum Darwinii

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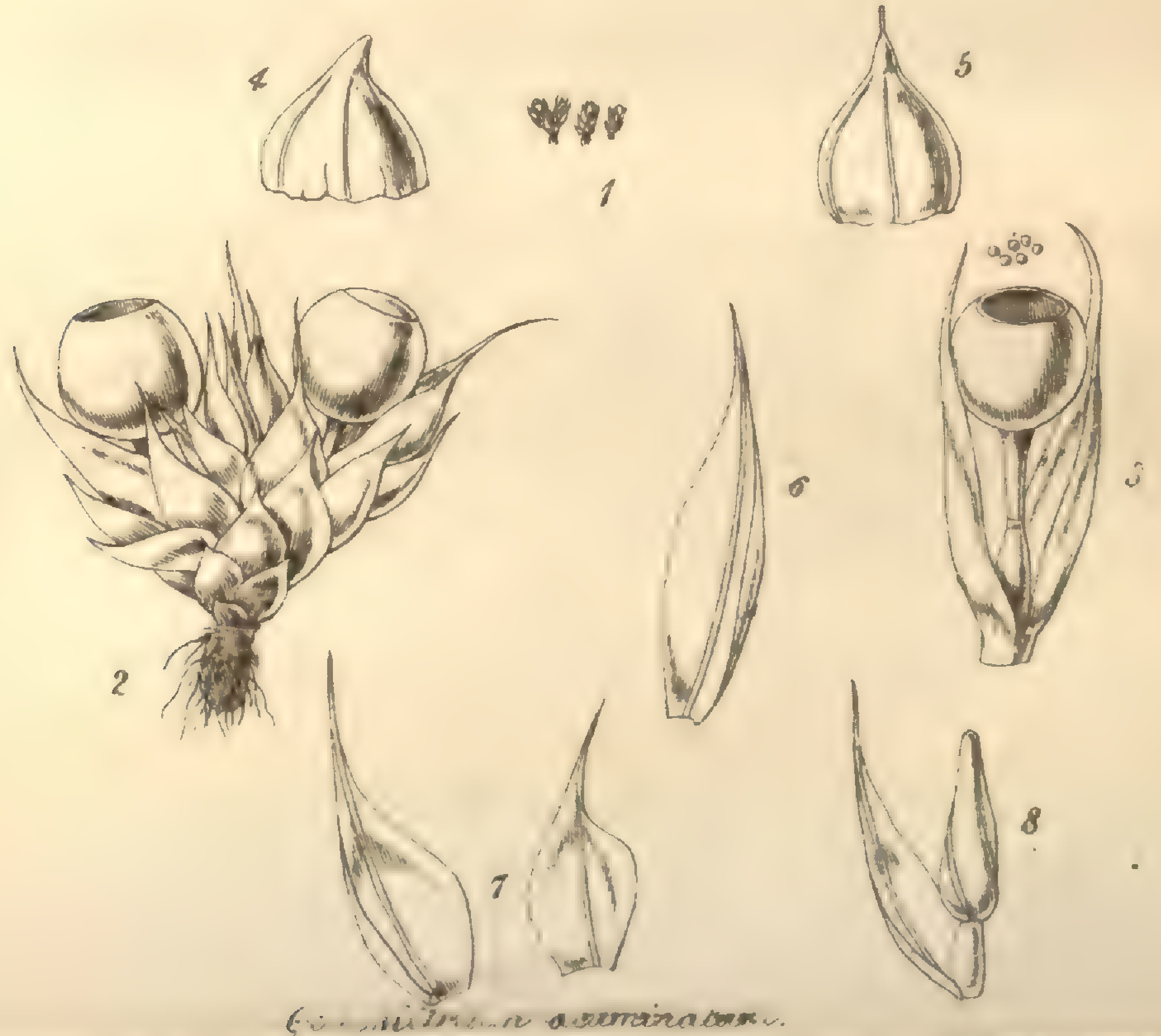
A

Goniomitrium enerve

B



Goniomitrium acuminatum.

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Anictangium repens

Zygodon [illegible]

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Bolivaria robusta.

Miss Drake del.

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noniga Brenonis

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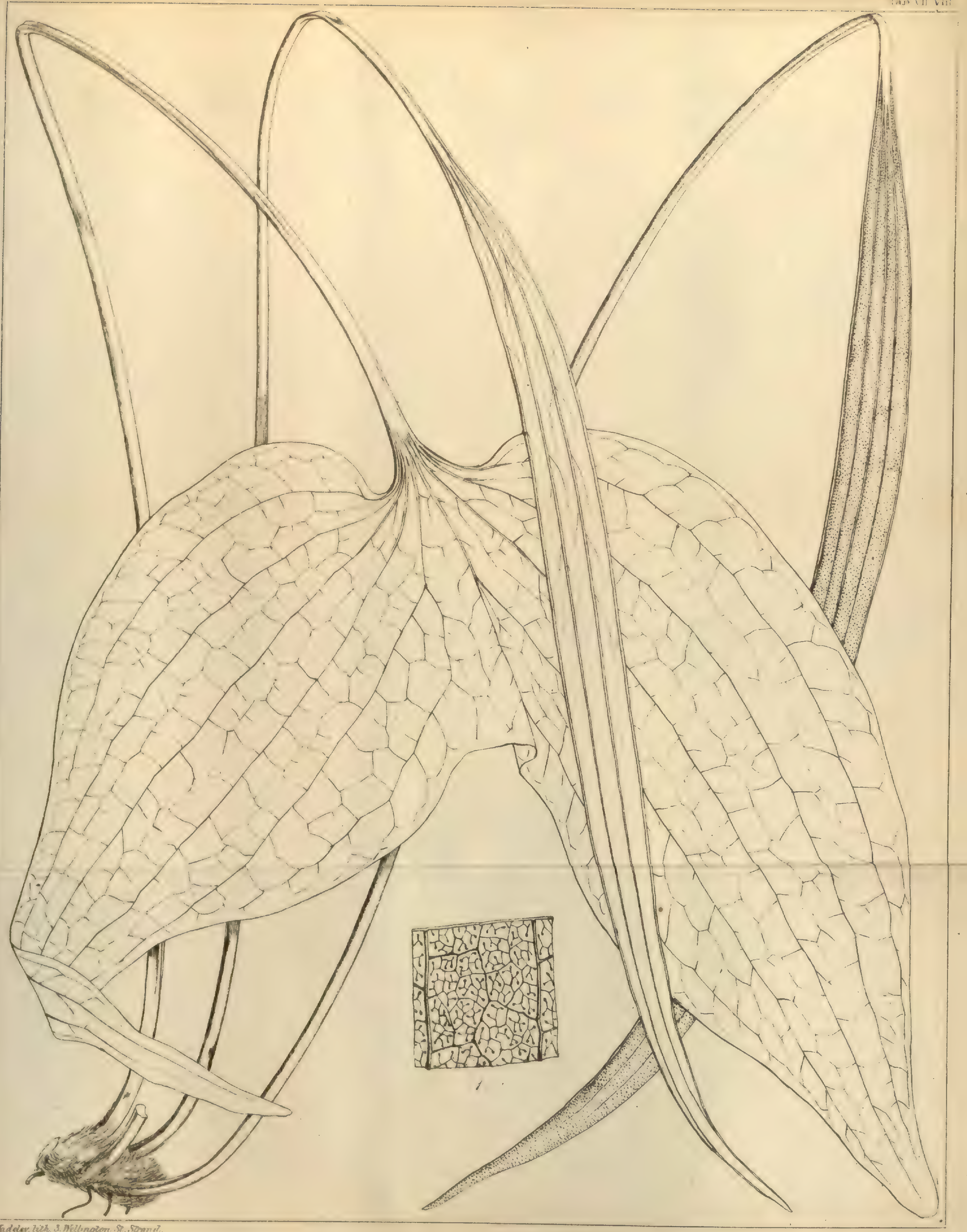

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Gymnopteris Vespertilio.

Waddey lith. 3 Wellington St. Strand

Purdiea nutans.

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Thysanothecium Hookeri.

1

Whitlavia grandiflora.

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Whitlavia minor

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Plantago Gunniana

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W. Wilson del. Fitch lithc.

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2. *Lysurus Gardneri.* 1. *Simblum gracile*

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Aseroe Zeylanica.

W. Fitch del.

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Godoya splendida. Planch.

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Godoya Antioquiensis.